

AVIATION WEEK

Guide to Government Aviation Buying ...
PROCUREMENT FOR AIR POWER

SEPT. 25, 1950

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A YEAR

ask the men who KNOW
L-M High Intensity Runway Lighting



WRIGHT: amazed at low operating cost.



FOX: better operations in all kinds of weather



CROSS: pilots see lights 50 miles away.

Ask H. C. WRIGHT at Nashville

You'll get an enthusiastic answer from H. C. Wright, the capable superintendent of Berry Field. "We've had some remarkable experiences here since we installed high intensity lights, and their performance has been most gratifying to pilots and to the city. The controllable beam eliminates glare while taking full advantage of the high candle-power. The lights are most definitely paying for themselves in improved operation and increased safety for ships and passengers."

- Ask pilots and other airlines men, airport consultants, airport managers, and the many other men who know the problems of operation in marginal weather! They know the advantage of L-M high intensity runway lighting. They know the value of its extreme penetration without glare, its low operating cost, its high intensity controllable beam. For information on this and other L-M lighting for large and small airports, ask the L-M Field Engineer, or write Line Material Co., East Stroudsburg, Pa. (a McGraw Electric Company Division).

Ask FRANCIS FOX at Worcester

Worcester, Mass., was one of the first city-owned airports with L-M High Intensity Lighting on all runways. Manager Francis T. Fox and members of the City Airport Commission made a very careful check with other airport managers before the decision was made. Captain Fox, a pilot himself, recently told us: "We've had nearly three years of operation now with high intensity lights on all runways. Our lights have proved their value with better operations in all kinds of weather."

Ask HANK CROSS at Birmingham

"When I was test flying B-29's here during the war and until 1949, the blackest area was over the municipal airport. The mountains and smog conditions peculiar to Jones Valley added to the problem," writes H. T. Cross, well-known Director of Aviation of Alabama's biggest municipal airport. "Last fall we installed high intensity lighting on all three runways. Airlines, pilots, and tower operators are all most enthusiastic. Pilots report seeing the lights more than fifty miles away. Typical pilot's comment: 'Now I won't be trying to let down on the First Avenue street lights instead of the runway!'"



L-M's 100,000 cp. high intensity runway light with the famous controllable beam.



LINE MATERIAL... Airport Lighting

YOU CAN BE SURE.. IF IT'S
Westinghouse



These leading U. S. Air Force **PENETRATORS**
are **POWERED** by Westinghouse

Being penetrators, these planes must carry out
secret missions deep into enemy territory. To pro-
vide the required fuel economy and dependability,
Westinghouse J34 turbines have been chosen for
their power plants.

Westinghouse is constantly striving for im-
provement in jet propulsion... to provide only
the best for the United States armed forces it is
privileged to serve.



B.F. Goodrich



New plane lands in 80 feet on B. F. Goodrich brakes

THIS AIRPLANE takes off and lands
in less space than any other small
cabin aircraft. It's the new Piper Super
Cub 105.

In test flights, the 105 has landed in
the width of a one-strip, braked to a
stop in only 80 feet. One of several
outstanding features that make this
performance possible is the B. F.
Goodrich brakes—standard equipment
on all Piper models.

B. F. Goodrich Supatite T-1000 brakes
absorb more kinetic energy for their
weight than any other brake. This means

power results from the expander rate
action, which applies equal pressure
over the full width of the drum. This
also makes brakes operate with no
grinding or locking, and slower, more
even wear.

Brakey is another lead-in feature
of B. F. Goodrich brakes. There are
fewer parts—and they last longer.
Maintenance takes less time, which
can be handled with a screwdriver and
pliers. Best of all, sign brakes and tires
are disposed of rapidly.

Because B. F. brakes have so many

advantages, their use is growing
by leaps and bounds. They're on the
biggest planes (like the B-52 and Con-
stellation), on government aircraft (Bom-
bers, etc.), as well as private planes like
the Super Cub. B. F. Goodrich Company
makes only B. F. Goodrich aviation
products here. The B. F. Goodrich Co.,
Aviation Division, Akron, Ohio.

B.F. Goodrich
FIRST IN RUBBER

ON THE FRONTIER —AMERICA'S LARGEST FEEDER AIRLINE



FRONTIER AIRLINES, green tree combats the deserts. Frontier Airlines, Missouri and American Airways, connects all major cross-continental and regional routes... serving the people and cities of the Rocky Mountain region with modern, dependable

dependable airline travel. Major routes usually longer distances, linking more than 70 cities and towns in seven states. The dependable engine lubricants in difficult flying territory. Frontier dealers are Texaco. Always depend on the Texaco.

TEXACO helps keep efficiency high, costs low

Flying up and down and across the Rockies, Frontier Airlines' planes cover a territory that demands unfailing engine dependability. And from long experience, Frontier knows it can count on that dependability — and economy, too — with Texaco Aircraft Engine Oil and Texaco Lubrication Engineering Service.

People everywhere enjoy major airline maintenance economies with the help of Texaco. Texaco Lubrication Engineering Service sparks practical ideas aplenty for servicing and lubrication procedures that boost efficiency and bring down costs. And with Texaco Aviation Products

you are set up to handle off your lubrication jobs with a minimum number of lubricants.

Texaco Aircraft Engine Oil has long been their choice of America's airmen. Today, as for many years past — more revenue airline miles in the U. S. are flown with Texaco Aircraft Engine Oil than with any other brand.

Let Texaco help make yours a more profitable operation. Just call the nearest of the more than 2,000 Texaco Wholesale Distributing Plants in the 48 States, or write: The Texaco Company, Aviation Division, 135 East 42nd Street, New York 17, New York.



TEXACO Lubricants and Fuels
FOR THE AVIATION INDUSTRY

To the Industry . . .



Today the USAF faces the task of meeting increased requirements necessitated by the Korean situation and our expansion programs. Inevitably, we must depend upon the full cooperation and demonstrated capabilities of America's aviation industry.

To the layman the aviation industry is often considered to be confined to the aircraft manufacturers. While that segment of the industry plays a part of major importance, it is pointed out that approximately 90% of today's airplane, dollarwise, is supplied from manufacturers other than that source.

The USAF wishes to encourage competition and increased participation by these other manufacturers in order to broaden the base for emergency expansion of the aviation industry and to meet the accelerated production schedules under our current programs. In line with this thinking, the USAF has requested prime contractors to thoroughly survey the field of possible subcontracting before making demands on the government for increased plant facilities. Such a policy, we feel, will have the effect of not only broadening our industrial capabilities and meeting the increased requirements, but will place an increasing amount of Air Force business into the hands of smaller manufacturers.

The dissemination of procurement information to additional potential sources is a valuable service to both the Air Force and the aviation industry.

K. B. Wolfe

K. B. Wolfe
Lieutenant-General, USAF
Deputy Chief of Staff, Materiel



With appropriations scarce, we find ourselves facing squarely the job of attaining the production schedules which have been made out of go.

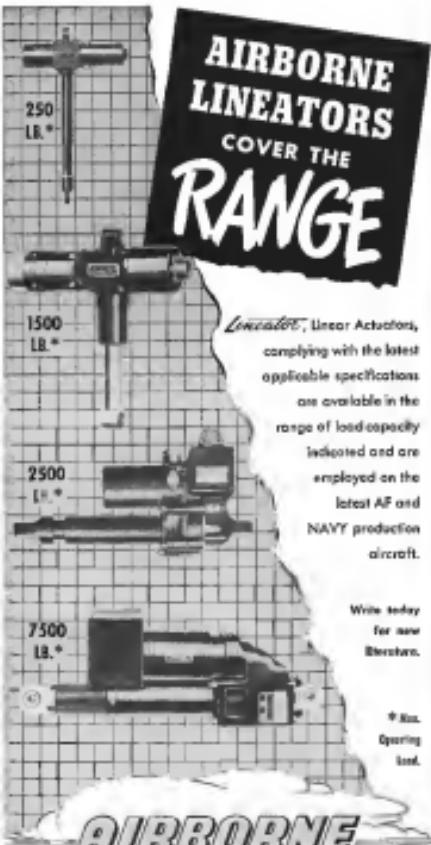
At the moment, all concerned are threshing around, in the uncertainty of whom and what controls will be applied, in efforts to live up to facilities, personnel, subcontractors and material.

Inevitably, competition has entered all of these fields. Without it, it is questionable whether very many of us would be putting out all of the effort of which we are capable, and, at this point, the competition strives to emphasize the areas in which we are weakest and to which modification must be applied.

The Bureau of Aeronautics is endeavoring, with all of the means at its command, to alleviate the trials of this period of transition from plans and expectations to requirements to deliver the hardware. Adjustments in programs, assistance in acquisition of facilities and materials, approval of extensive subcontracting, and examination of proposals of newcomers to the industry are offered, all with a view to getting the equipment on order on schedule and at a reasonable price, and toward improving our mobilization potential if this be required.

A. M. Price

Rear Admiral, USN
Chief, Bureau of Aeronautics



AIRBORNE ACCESSORIES CORPORATION

25 MONTGOMERY ST. • HILLSIDE 5, NEW JERSEY
LOS ANGELES, CAL. • DALLAS, TEX. • OTTAWA, CAN.

NEWS DIGEST

Rentzel to CAB

Senate confirmation was expected late last week on the nomination of Delos W. Rentzel to become Chairman of the Civil Aeronautics Board, and of Donald W. Nyrop to succeed Rentzel as Civil Aeronautics Administrator. Nyrop has been deputy administrator.

Close cooperation between CAB and CAA is expected to result from the Rentzel appointment, possibly leading to a revision of the two federal agencies, separated in 1946. In this event CAB Chairman Rentzel probably would also serve as administrator, following the action of the Maritime Board and Maritime Administration reorganization (AVIATION WEEK, June 12).

Edward M. Shadlow, executive assistant to the administrator, probably will succeed Nyrop as deputy administrator.

Turbodyne to GE

Cessna Electric Co. last week announced completion of final purchase of the Turbodyne Corp. and its Turbodyne propeller turbine engine, confirming Aviation Week's exclusive report of July 11 that GE "nosed back into the turboprop field by purchasing the Turbodyne." G. W. LaPere, GE Aircraft Gas Turbine division manager, and the previous included patents, name, and technical data, and that GE would not and could never sell engines built by Turbodyne.

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100 Groups for AF

Joint Chiefs of Staff have asked President Truman for another large increase in Air Force and Navy plane procurement for fiscal year 1951, at the beginning of a build-up of a 90 to 100 group Air Force, instead of the 69 group level generally planned for.

Navy plane procurement boards asked would enlarge Navy air strength correspondingly, to equip and operate 12 large and 15 small aircraft carriers, as compared to seven and eight carriers now operated.

Prototype Bill Ready

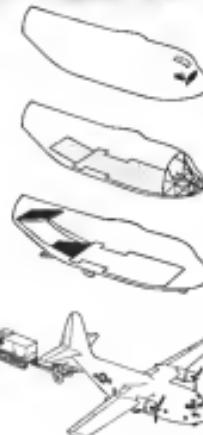
Prague last week by the House of the \$12.5 million air transport prototype testing bill, currently considered Congressional action except for Senate concurrence in minor amendments, including one sponsored by the Air Line Pilots Assn. which would make organized labor representatives consultants in planning the test program.

AVITRUC —keeping ahead



World War II emphatically demonstrated the urgent need for versatile cargo aircraft. In today's military logistics, rugged assault transport planes, capable of landing troops and supplies in forward combat areas, or on short unprepared fields are basic requirements.

Avitrus is the result of combined research by Armed Forces and Chase engineers to produce an assault aircraft which meets these specifications:



EFFICIENCY

Standardized cockpit instrumentation provides simplicity of operation, facilitates training of new pilots and reduces familiarization time of experienced flight personnel.

SAFETY

Steel tube nose, rounded flight deck, and sturdy bulkhead between cockpit and cargo compartment provide maximum protection for flight personnel. Tie-down fittings each with 10,000 lb. capacity in any direction, on a 20" grid pattern in cargo compartment floor assure load safety, prevent cargo shifting.

ACCESSIBILITY

Power extended, full width, low angle ramp gives access to unobstructed cargo space, permits fast, simplified movement of rolling stock, bulk cargo and troops.

PERFORMANCE

Avitrus will carry a useful load greater than its own weight. At "Exercise Swarmer" last spring, two Avitrus landed, unloaded and were again airborne in less than four minutes, proving conclusively their value as assault cargo aircraft.



This Is Your Aviation Market

Your aviation market is larger now than at any time since the war.

Before next June 30:

- Contracts for \$7.5 billion will be let for new planes.
- More than \$4 billion in orders will go to subcontractors, material suppliers and vendors of parts.
- More than \$1 billion worth of contracts will be ordered.
- More than \$7 billion will be spent by the Air Force on buying, maintaining and flying aircraft, more than \$3 billion will be spent by the Navy.
- At least \$2 billion will be spent by the two services on aviation equipment, some for new planes, the balance for operating, maintaining and overhauling existing planes and for training.

The largest lump of government aviation funds, of course, will come to the manufacturers of airframes and engines. \$4.4 billion from the Air Force, \$2.2 billion from the Navy, and \$1.1 billion from the Metal Defense Assistance Program.

But your Air Force and Navy market goes beyond the purchase of new aircraft.

- Roughly 56 percent of the money budgeted for new planes goes to the aircraft manufacturers.
- About 32 percent is spent for powerplants and propellers.
- About 13 percent purchases electronics installed in the planes.
- Another 1 percent buys the aircraft.

Approximately 4 percent of the money is spent on instruments, landing gear, special handling equipment and tools, and the many other items peculiar to each type of aircraft.

In buying planes, all steer except the airframes are "Government-Furnished Property" (GFP) which the services buy direct and have shipped to the aircraft manufacturers. In fiscal 1961 plans, GFP for new planes totals about \$3.3 billion, actually a little more than one-half the expenditures of AF and Navy on new aircraft.

► Additional Purchases—There is at least \$700 million more to be spent on equipment for existing planes, for training devices, for fixtures for ground handling and servicing, for meteorological purposes.

And fuel purchases will amount to several hundred million dollars. In its original budget, the Air Force requested \$10,570,000 for fuel and oil. That was before Korea. In its supplemental appropriations request, the Air Force did not disclose how much it was asking for fuel; the Navy did not detail its fuel purchases in either its original or supplemental budgets.

Weapons and ammunition will cost the services about \$600 million.

► The Equipment Market—The military aviation equip-

ment market is the most appealing for aviation business men in general. Since the end of the war, less than a half-dozen new companies have succeeded in getting prime engine or aircraft production contracts.

By several ways of reckoning, the Air Force and Navy market for aviation equipment is more than \$2 billion, excluding fuel.

And it is a market for thousands of firms.

Reports of the Senate and House Appropriations subcommittees on the Air Force and Navy budgets spotlight some of the major equipment purchases planned under the original budgets. Detailed break-downs of all equipment spending were not included in the supplemental appropriations asked after Korea.

These reports, though preliminary, show the nature of military aviation equipment spending.

- Weapons and ammunition, \$600 million.
- Photographic equipment, \$12 million.
- Flight clothing, \$2.5 million.
- Shop and warehouse equipment, special equipment for laboratories, and other purpose, \$2.5 million.
- Meteorological equipment, \$8 million.
- Training equipment, \$2.5 million.
- Aircraft spare parts for maintenance and overhaul, \$915 million.
- Weapon spare parts, \$1.5 million.
- Engine overhauls, \$2.7 million.
- Catapults and RATOs, \$2.7 million.

These items total \$778 million. Add to that figure the projected Air Force and Naval Aviation avionic expenditures (page 45) totaling \$983 million. GFP for new planes, excluding aircraft and fixtures, comes to about \$300 million.

That indicates that at least \$2.1 billion in military aviation equipment will be consumed for fiscal 1961.

There's another way to get a line on the equipment purchases. Roughly 15 percent of the new-plane funds will go for equipment (the other 82 percent goes to airframes and powerplant manufacturers). That equals about \$1.2 billion. Add to that the \$778 million and non-GFP avionic expenditures of \$486 million, and you get total military aviation equipment funds of nearly \$2.4 billion. So the market is about \$2.1-\$2.4 billion.

► The Trend—That is the equipment picture as it appears this early in the Air Force and Navy re-equipping programs. A study of the services' requirements reveals some trends of what the future may be like.

- Overhaul and replacement parts for airframes and engines will be bought in greater amounts.
- Radio and radar parts purchases will increase.
- Training equipment expenditures will rise.

—William Krager

What the USAF and Navy Will Spend:

\$11,541,611,298

Below are obligations contemplated under the 1961 fiscal year budget. An Air Force budget totals \$9,926,304,000, including pay and allowances not shown in table below. Naval Aviation's budget, also including pay, totals \$1,473,989,000.

U. S. Air Force

	1949 (Actual)	1950 (Estimated)	1951 (Estimated)
Aircraft and related material	\$661,511,475	\$1,013,817,000	\$4,542,486,700
Electronics	49,948,918	125,675,000	115,960,000
Guided missiles	12,745,579	16,580,227	27,775,000
Industrial mobilization	1,474,700	1,474,700	1,537,400*
Industrial mobilization, vehicles, training and equipment	31,422,863	121,615,000	465,686,000
Maintenance and operation	1,080,114,734	1,038,706,112	3,848,783,000
Research	25,891,945	28,465,166	32,24,000**
Development	137,634,585	126,916,585	120,739,000**
Operational engineering	7,618,215	14,577,000	31,490,000**
Reserve aircraft, maintenance and operation	24,351,818	21,776,973	31,712,000
Reserve mobilization, maintenance and operation	34,412,000	21,776,973	31,712,000
R&D	1,785,900	8,467,000	9,600,000
ANG aircraft, maintenance and operation	20,147,468	26,771,973	21,397,940
AMC aircraft, maintenance and operation	34,369,712	54,804,533	49,648,330
Total		\$2,046,218,731	\$1,211,364,791

* Exclusive of an undetermined allocation from a \$70,000,000 appropriation made to the Secretary of Defense for industrial mobilization.

** Exclusive of an undetermined allocation from a \$120,000,000 appropriation made to the Secretary of Defense for industrial mobilization.

Naval Aviation

	1949 (Actual)	1950 (Estimated)	1951 (Estimated)
Fleet aircraft procurement	\$102,467,310	\$140,652,158	\$27,585,120,000
Fleet aircraft procurement	11,221,691	14,508,000	15,800,000
Technical equipment for service training	1,349,998	1,458,000	3,260,000
Aircraft maintenance	5,923,650	2,847,000	5,889,000
Delays for new aircraft	25,184,117	16,596,539	46,741,000
Flight operations, regular	75,481,174	78,481,174	81,770,000
Flight operations, irregular	16,229,165	16,229,165	20,770,000
Aircraft overhaul, regular	145,271,687	147,687,379	158,681,000
Aircraft overhaul, reserve	44,262,492	40,974,138	43,361,000
Station operations, regular	125,977,671	130,972,211	127,705,000
Station operations, reserve	8,391,796	9,124,049	9,124,000
Supporting equipment, material and services	36,571,771	34,186,562	60,779,000
Research and development	11,046,188	7,722,194	14,222,000
Industrial mobilization	6,613,143	6,662,949	13,184,493
Total		\$956,714,471	\$1,073,351,773

Mutual Defense Assistance Program

	1949 (Actual)	1950 (Estimated)	1951 (Estimated)
Air Force			
Aircraft and spare	505,871,648	\$1,013,817,000	\$1,013,817,000
Aeronautical equipment and supplies	1,172,719	84,409,733	86,210,462
Electronics and signal equipment	23,599,419		
Navy			
Aircraft, spare parts, and aeronautical equipment and supplies		6,536,000	32,061,588
Total		\$404,371,329	\$1,257,841,387

OF EVERY \$100 SPENT ON AN AIRPLANE...



Where the Aircraft Money Goes

Subcontractors, material suppliers and parts vendors get over \$4 billion of the \$7.5 billion spent on planes.

By Rudolf Medley*

If you have sold parts or materials to aircraft makers or their subcontractors, far fewer, you would say, were higher than you think.

Less than 100 prime contractors will have to spend a total of more than \$4 billion with vendors and subcontractors from this fiscal year's aircraft procurement funds.

Out of every hundred dollars spent for military aircraft procurement, about \$50 is spent for airframes, \$10 for powerplants and propellers and the remaining \$30 for communications equipment, armament, and other accessories. The procurement, production and procurement programs by the government and forwarded to defense prime contractors far foul underway into the service.

But the actual distribution of funds goes no indication of where the money goes. This article will try to establish the ultimate distribution of aircraft procurement funds.

*Airframe—Let us look first at what happens to the \$30 spent on airframes. This amount goes to about 25 so-called prime contractors, which are the firms to enter into direct contractual relations with the government to deliver a finished product.

But these companies are not, and never have been, so prone to the notion of the material and do all the necessary work by themselves.

Even in 1945, in the early days of war, subcontractors spent 17 per cent of the value of their products on material, supplier, fuel and purchase charges. Since then, more and more has been taken from the contractor.

In 1972, 26 percent of the value of the products of aircraft subcontractors went to pay for parts purchased. No figures have been published by the Bureau of the Census even then on this subject. But the 1949 annual report of Congress states that aircraft subcontractors spent 34 percent of the value of their

products in that year for material, contract work, etc.

This percentage is about equal to that spent by defense prime contractors—about one-half—and we shall probably not be far wrong in applying the same ratio to subcontractors and armament which have been so far mentioned.

*Subcontractors—Although the concept of subcontracting is limited to the aircraft industry, we shall use the term "subcontractor" to mean the prime contractors do not own the equipment to do this work within their plants.

The figure for the Republic P-47 fighter production in Farmington, L. I., is a characteristic sample of ultimate subcontracting.

Figure 1 shows the Republic P-47 fighter production in Farmington, L. I., is a characteristic sample of ultimate subcontracting.

December	Percent subcontracted
1941	10
1942	23
1943	52
1944	68
TOTAL	\$100

If we apply the 33 percent figure to \$7.5 billion worth of aviation peace and war contracts available, we find that about \$4,113,000,000 will flow to subcontractors, vendors, and material suppliers.

*Engines and Propellers—Of the \$10 which go to subcontractors of powerplants and propellers, an even larger share will go the same way. Even in 1949, outside purchases accounted for 56 percent of the value of engines shipped. By 1957, this had grown to 46 percent. And subcontracting during World War II, both for engines and for aircraft, reached substantially higher figures than subcontracting for turbines.

It is therefore reasonable to expect that \$20 out of the \$30 available is engine and propeller prime contracts will go to subcontractors, vendors, and suppliers of material.

*Components and Accessories—No overall data are available for sales of components and accessories which covers communications equipment, armament, photographic equipment, instruments, and several other such categories.

According to the 1947 Census of Manufactures, aircraft accessories (which includes aircraft radios, bombs units, armaments and defense subassembly, but excludes armaments and electrical equipment) manufacturers spent 34 percent of the value of their

*In establishing this estimate, subcontractors have made for this purpose their own calculations, and the result of their calculations seems to indicate that more than 50 percent of all the subcontractors used in this country is the second largest in the world.

From this we can estimate that roughly one-third of the money received from sales by defense manufacturers went for outside purchases. Two thirds represent what is being called the "value added by subcontracting."

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Thus, of \$32 subcontractors in the aircraft industry in 1947 (some of which are not prime contractors) many relied heavily on outside help, for military work, operations. Only four of these plants did their own cutting, eight others were larger and used their own powerplants, fuel, and powerplants. Fifteen had their own laboratories, and the more number reported extensive status machine departments.

*Military Distribution—Surveying up, we find that out of every hundred dollars spent for military aircraft procurement we may soon expect the following ultimate distribution:

Airframe prime contractors 10%

Engines and propeller prime contractors 16%

Components and accessory prime contractors 16%

Material suppliers, vendors, subcontractors 58%

TOTAL \$100

If we apply the 33 percent figure to \$7.5 billion worth of aviation peace and war contracts available, we find that about \$4,113,000,000 will flow to subcontractors, vendors, and material suppliers.

Where will the subcontractors be?

*Industry Speaks—The source of all these subcontract will be the prime contractors and not the government, directly. The source of prime contractors is the aircraft industry.

Even at the height of World War II, there were 1,200 aircraft plants only 55 aircraft, 23 engine, and 5 propeller facilities operated by prime contractors.

Renewed quantity production of war aircraft will probably be based on even fewer plants of prime contractors.

What will be bought and from whom?

Considering the enormous size of the market it is surprising how little is known about it, but these are some of the things we do know:

*Metal Market—Aerospace is probably the most important item on the list of materials.

These goods of aluminum and magnesium are required for every pound of aircraft and aircraft parts shipped in 1947. An additional half-pound of rough and semi-fabricated aluminum castings were consumed by the aircraft and engine industries.

This consumption rate, which is not very different from that prevalent during World War II, increased but more than 50 percent of all the aluminum used in this country is the second largest in the world.

There were also consumed in 1947 4.6 lb of steel, 1.6 lb of copper and 1.6 lb of brass per pound of aircraft weight shipped. Of the 4.6 lb were stainless steel and

aircraft bearings. Castings (15,000,000 lb) steel and copper 21.6 million lb. Steel, copper, and aluminum 11,000,000 lb. The Census Bureau of the Commerce Department, 1947.

*Metals—U.S. Steel, 1947, "U.S. Steel," Bureau of the Census, 1947.

*Civil Aviation Administration, U. S. Civil Aviation Administration, 1947.

*Report on Military Appropriations 1948, Government Printing Office.

Renegotiation

Learn the principles of the law; your contracts may be affected.

If you do enough business with the government, renegotiation concerns you.

With a few exceptions, all contracts over \$100 for aircraft and related material have been subject to government review of profits. If they were signed after July 21, 1941, under the Renegotiation Act of 1941, they became effective.

But since July 1, 1949, all "agreements" contracts in excess of \$100,000, for aircraft or other material have been subject to renegotiation. Also subject are all contracts in excess of \$1000 as do many prime contracts that are negotiable.

*Little Chars Get Away—To simplify the complex problem of renegotiating big business deals with government, legislation provides that renegotiation proceedings will not be coordinated with a company until its gross annual war time contracts and subcontractors amounts to more than \$100,000 as do many prime contracts that are negotiable.

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but integrated aviation industrial planning of the Navy, Air Force and Army has been a reality since the World War II days of the Joint Aircraft Scheduling Unit, an extensive consolidation group.

► **Package Programs**—Air Force and Navy divide their system planning into package programs for specific air issues. These are subject to review in cycles, to insure that new industry issues and system problems have not made them out of date.

But the new Korean peace plan has thrown out of cycle by the new agreement which has necessitated a new look in many of the old plans.

Each package plan sets up the responsibilities for making a specific plan or system component. Manufacturers are faced with peak production rates required. Manufacturers show potential production of each manufacturer, any additional design requirements for high volume production, and the current status of the plan or component. Complete plant requirements for a subcontracting program and requirements for plant capacity, machine tools and manpower are shown.

► **Mobileization Details**—Details of the expenditures to be made under the additional industrial mobilization budget made available in the supplemental budget are not yet firm. As a guide to how the new levels will be expended, however, the pre-Korean base fixed over 1951 industrial mobilization budgets are helpful.

Air Force planned to spend \$10.5 million of its \$34-million total for industrial preparedness measures as follows:

- **Mobileization preparedness**, \$2,347,657.
- **Logistics Reserve contracts**, \$2,065,994.
- **Subcontractor preparedness**, \$370,000.
- **Basic studies**, \$100,000.
- **Manufacturing methods**, \$4,691,680.
- **Materials planning**, \$573,000.
- **Air Force contribution to Joint Armed Services Medical Procurement Agency**, \$11,619.

Longer-term items in the budget are for maintenance of four reserve Air Force planes, \$1,694,000; and for maintenance and corrosion prevention on the Air Force nuclear test plane, \$12,200; machine tools and 33,000 other related production equipment and \$10,000.

Non-bonus 1951 aviation industrial planning budget called for spending \$2,246,000 on direct contracts for industrial preparedness, \$765,000 for industrial preparedness studies, \$67,000 for machine tool preservation and repair, and \$128,000 for reserve plant maintenance.

► **Supplemental Spending**—Without any official program yet crystallized for the

large supplemental industrial planning appropriations, it is still logical to predict that the distribution of funds will be something as follows:

► **Subcontractor preparedness**—Contract will get heavy emphasis. This field has been almost overlooked heretofore, but due to the pared-down mobilization budgets.

► **Steps to put into use improved manufacturing methods**—already developed and will have emphasis, in large volume production as well as in the Korean peace plan. This will be the next major concern, which will lead to increases on the small T-35 aircraft-manufacturing contractors rate of June 1950, will quickly pay off when larger numbers of planes will be called for.

► **Further research into manufacturing methods**—will be called for. Last January, Air Materiel Command instructed 56 manufacturers' methods projects for investigation, but had to cut back to 40, because of lack of funds.

Such projects may require basic tooling and fixtures, new high-volume tooling and production equipment and processes, as well as strong materials and methods.

Further extension of license-lease contracts may be undertaken, with major updating of license-lease agreements, particularly in the Korean area. Some of these presently disclosed by the Air Force cover such manufacturing items as the Wright R-1820 engine for the T-33 North American trainer, General Electric's J-47 and Allison's J-35 jet engines, Curtis and Hendrick Standard propellers, radio and radio equipment, fire control systems, bombing systems, compasses, tachometers, charges, and assemblies of key implements in the 1951 procurement program, as well as other licensing presently unlisted.

► **Photographic Equipment**—All photographic equipment for the three aircraft will be supplied by the Photographic Division, Air Materiel Command, Wright-Patterson AFB, Ohio.

► **Medical supplies**—All medical supplies for the armed services are bought by the Armed Services Medical Procurement Agency, 44 Santa Street, Brooklyn 1, New York.

► **Hand Tools**—Navy Purchasing Office, Navy Department, Washington 25, D. C. is charged with the purchase of all hand tools, edge tools such as saws, mechanized sawing tools and similar items for all three services.

► **Prints**—For the armed services, including Air,陸海空軍, and Naval prints, diagrams and related products are purchased by the Aviation Supply Division, Air Materiel Supply Office, Oxford Avenue and Materiel Mill Road, Philadelphia 11, Pa.

Overall coordination for industrial preparedness, including all the above aspects, will be other military agencies as well, under the direction of Brig. Gen. Edmund C. Lassaud (USAFA), assistant director of the Materiel Board staff, and chairman of the Materiel Board Aircraft Committee.

Joint Procurement Simplifies Selling

Joint procurement, because of the economies afforded the government both in time and in paper work, has already expanded and now costs 90 percent of armed services total buying requirements for certain items.

The remaining 11 percent is controlled by the individual services for items of single service equipment.

Defined by action of the Management Committee of the Department of Defense last year, the Materiel Board now assigns responsibility for the purchase of combined requirements to the armed services.

Because of space requirements of the Air Force and Navy, purchases of services, aircraft engines and propellers are divided between the two services. However, to eliminate possibility of duplication the Materiel Board has worked out a system of co-operation within the aircraft and principal components field.

► **Ordnance**—All aircraft ordnance material, with exception of a few special items, is purchased by the Army for USAF by the Army Purchasing Agency, Dover, N. J. Naval aircraft ordnance is purchased by the Bureau of Ordnance, Navy Department, Washington 25, D. C.

► **Pad**—Pad and all requirements of all three services are purchased through the Armed Services Purchasing Purchasing Agency, temporary building 6, Washington 25, D. C.

► **Photographic equipment**—All photographic equipment for the three aircraft will be supplied by the Photographic Division, Air Materiel Command, Wright-Patterson AFB, Ohio.

► **Medical supplies**—All medical supplies for the armed services are bought by the Armed Services Medical Procurement Agency, 44 Santa Street, Brooklyn 1, New York.

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Final details as to procurement arrangements of the three services are listed in Materiel Board's Index of Materiel Purchasing Officers. Copies may be obtained by writing to that agency at Washington 25, D. C.

SELLING TO THE AIR FORCE

Where the \$4.4 Billion Will Go

Procurement plans call for 4485 new planes in 1951 budget; trend is toward more subcontracting.

By Ben Lee

The United States Air Force, with more money to spend than at any time since the close of World War II, is buying 4485 aircraft at a total cost of \$485 million from its share of fixed \$51 loads.

While group structure of the Air Force has not changed materially as a result of the war in Korea, there is an increased procurement requirement placed upon the Air Force to support the mission of America's allies.

► **Background**—In May 1948, Congress, in an effort to speed up aircraft procurement, granted USAF obligation authority of \$362 million for aircraft procurement. The Air Force represented the requirements for the first year of an unbudgeted five-year procurement program. This action had been taken in line with recommendations of the Five-Year Committee and of the Congressional Aviation Policy Board, which recommended a maximum of 70 groups.

In December 1948, however, the President ordered a cutback of funds to finance only 45 groups.

By that time the Air Force had actually selected 49 groups and planned for 70 groups early in the year 1950.

The Air Force problems then became not one of expansion but one of contraction to 45 group level. To the solution, struggling through postwar recession, it was a slow blow.

That left Air Force, down to fiscal 1951, with an operational force of 3100 first line combat aircraft, comprising 15 heavy bomber groups, 27 medium light bomber and fighter groups, and 6 transport groups. Pounds were provided for 3500 aircraft from fiscal 1950 budget.

A fiscal 1951 appropriation of \$179 million was allocated to USAF for aircraft procurement, including 1000 transports and 1000 bombers. The supplemental budget granted USAF an additional \$777 million for aircraft and tripled previously planned T-1 procurement.

► **AF Missions**—Air Force procurement budget for a 69 group structure is used in building a thousand aircraft.

► **Strategic Air Force**—The Strategic Command of USAF remains the backbone of U. S. air power. This fact is reflected in specific contracts awarded Consolidated Vultee for B-52 bombers and Boeing Airplane Co. for the B-57.

► **Tactical**—In the theater field, Air Force has awarded North American for B-47 bombers, Republic for F-105, and Consolidated Vultee a contract for lightly loaded T-38s that were cut out in fiscal 1950. There are an addition to the contract awarded Lockheed for dual purpose T-33s previously mentioned.

► **Air rescue**—For air rescue services USAF has asked Grumman for production of the S-61 seaplanes, Sikorsky for the H-34, and Pascalis for the H-21 helicopters. These three companies have been asked for a unit that should run to more than 1000 aircraft.

► **Research and development**, USAF in fiscal 1951 is given \$305.5 million for research and development, acquisition of scientific equipment, \$166 million will be spent on electronic search and detection, radio equipment and weapons, aircraft guided missiles, guided missiles. The Air Force's share of the mission is to be spent in point-and-shoot research and development.

► **Warfare and weapons**—After entering final stages of development, moving forward after a long time lag due to design problems, present in weapon development are atomic and conventional guided missiles and homing devices.

► **Turboprop Engine**—Heavy emphasis on point-and-shoot aircraft is focused on point-and-shoot jet training. Despite the fact that the turboprop and dash jet engine has been curtailed by Air Force after World War II in favor of concentration on the turboprop, Navy-supported research has shown Air Force that Navy chosen for turboprop engines and for propfan were not only more fuel efficient in the high subsonic speed range.

► **Research**—Scientific research at AF is limited to procurement at the Air Force concerned only with the application of the physical sciences to the production of efficient equipment, but encompasses research of all sciences.

The Air Force funds for research and development are considerably increased. Air Force can for the first time concentrate on projects which aren't tied to training and development status because of lack of funds to bring them to successful conclusion.

Controlled missile research and development has been strong and many funds expended. Reluctant to finance guided missile studies, Air Force sources officially state that "a guided missile will soon become a part of the USAF weapons system."

quite (patterned after successful job sharing methods used in private firm name) known as the "vertical buyer" method.

With this option, primary responsibility and authority for procurement of a specific item is placed in the hands of a single individual qualified by personal knowledge and experience. Every buyer is assisted by a cost analyst and a cost audit writer, and these contracts require approval of a higher authority before they are sent to a procurement committee for review before approval.

This streamlined system has enabled itself to vendor because of its efficiency as well as USAF because of its capabilities for economical procurement.

Negotiated contracts play a major role, of course, in Air Force procurement in order to eliminate duplication of procurement and reduce delay. Competitive bidding, however, continues when the contract is a firm fixed price contract and when it is awarded to the best interests of the Air Force.

Small Business Act. All Air Force prime contracts obligate the prime contractor to exert every effort to subcontract work to small business. As a result of this program, small business firms have received upwards of 90 percent of Air Force contracts during this calendar year. Dollars wise this was only slightly 16 percent of Air Force prime contracts. The bulk of Air Force procurement money goes to buy semifinished, propulsive, and some of a similar nature.

There is a pronounced trend in USAF procurement to place orders for plane equipment, design, prototype, construction, or by direct government purchase. In some instances this has already been encouraged by the military to eliminate procurement red tape.

In addition, with the growing complexity of the aircraft and major manufacturing are writing an applying numerous items of equipment which were previously "government furnished parts." This is the result, apparently, of the military's competitive position and the desire of the manufacturer to expand business experience by fully agreeing to the successful bidding completion of his products.

Subcontracting by the prime contractor will increase, according to management stepped-up production and procurement of aircraft construction by USAF. Production of aircraft is on the increase from approximately 300 planes to 300 planes per month by Air Force.

The increased production will be handled, Secretary of Air Force Frost has stated, by existing facilities. This means inevitably that small business is due for a deluge of orders from the prime contractor.

Procurement Terms

- **Acceptance:** A supplementary document in connection with an end item, contributing to the effectiveness thereof without extending or varying the basic document.
- **Acceptance Test:** Represents the sum of the contract negotiation time, flow time, holding time and lead time.
- **Assembly:** A unit of an end item composed of two or more parts fastened together.
- **Attachment:** A supplementary device fastened to, or mounted as a subinshore, vehicle, apparatus, or other end item to vary or extend the function thereof.
- **Commercial Item:** An article designed for and suitable on the open market.
- **Contact Negotiation Time:** Relative to AMC only. Represents the time between the initiation of a purchase request for a component until a defense contract is awarded. In those cases that require expedited action to meet a particular need, the time between the vendor's quotation on a basis other than a definitive contract, such purchase of time after TAWX or letter contract is issued, will be concurrently with the vendor's flow time until a definitive contract has been so completed. But to insure adequate time increments for initial as well as follow-on procurement, the contract negotiation time becomes an integral part of the planning procedure.
- **End Item:** A unit which, in itself, accomplishes a specific complete function.
- **Flow Test:** Relative to component vendor's plant only. Represents the time between the time the component vendor receives his contract and the time the component is completely fabricated and ready for shipment.
- **General Purpose Item:** An article adapted to some class or application.
- **Government-Furnished Parts or Property (GFP):** Those items of equipment which, under the terms of an AMC contract, the AMC furnishes to the aircraft or unseparated equipment manufacturer, without charge, for incorporation into end items being manufactured for the USAF, under that contract.
- **Lead Time:** Relative to aircraft manufacturer's plant only. Represents the time between the date the order is received at the aircraft plant and the acceptance date of the airplane or equipment in which it is installed. Most of the AMC aircraft is based on acceptance schedules. Therefore, when an end item date is expressed in terms of lead completion, it should be added to the difference between the day completion and acceptance schedules.
- **Lead time virus:** with the rate of production and during the different production periods, according to the following classification.
- **Pre-Production Period:** Represents the time between the date of the initial firm design contract and a production for production and the date of ship completion of the first article. (This period may relate to either conceptual or aircraft production.) During this time these tasks place the initial labor cost and stocking up of all item lead times.
- **Initial Production Period:** Represents the time between the ship date of the first article and the initiation of the peak rate of production for "leveling off" peak (increasing lead production facilities).
- **Peak Rate Production Period:** Represents the period from the time plateau is reached until production is terminated or delayed.
- **Licensee:** An individual, company, firm or corporation authorized by a licensor to use his proprietary design rights, manufacturing methods, or patents in the manufacture of article referred to as sole.
- **Licensor:** An individual, company, firm or corporation, holding proprietary design rights, manufacturing methods or patents, who enters into a written agreement whereby these rights, method or patents may be used by other individuals, corporation, firm, corporation or the government.
- **Modifications:** The physical alteration of a product or general purpose item, as required to meet a specific application of the procured article.
- **Part:** An individual piece of an end item or assembly.
- **Prime Contractor:** A contractor who has entered into a written agreement with the government to perform work as furnish supplier.
- **Setback Test:** Represents the sum of the flow time, shipping time, and lead time.
- **Special Purpose Item:** An article restricted by design or physical characteristics to an individual application.
- **Specification:** A description of the technical requirements for a material or item or a service, including a procedure by which the purchaser can determine whether or not the material or item has been met.
- **Schematizable:** A unit of an assembly composed of two or more parts fastened together.
- **Subcontractor:** A contractor who has entered into a written agreement with a prime contractor to perform work or furnish supplies.



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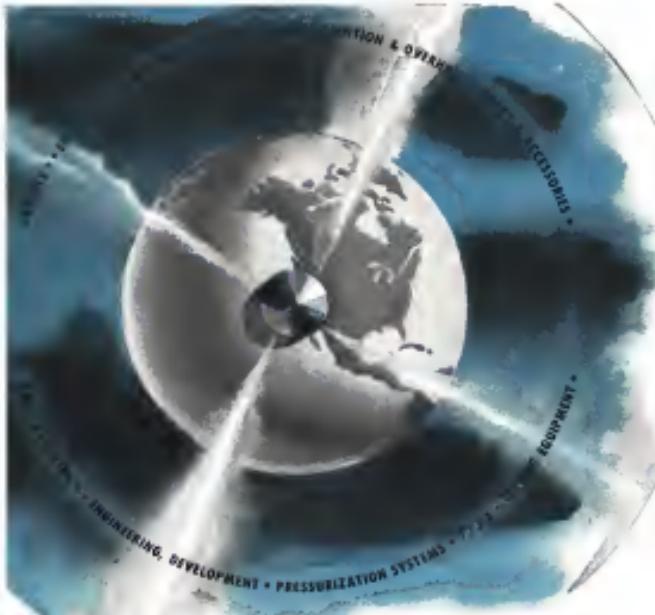
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Field Offices

They can save you time
in bidding, and help you
if you get a contract.

Expansion of the Air Force program is bringing with it an expansion of the government field office organization of the Air Materiel Command to provide additional service to old and new contractors in each region.

Many field office organization is still operated by seven major offices, but in addition, AMC is now opening up some new local offices in other cities where there is a large volume of contracts.

The seven main offices, telephone numbers and calling numbers are:
 • Boston: Library 3-6200, Boston Army Base, Lt. Col. F. C. J. Kline
 • Chicago: Bunker Hill 8-7000, 1060 S Hyde Park Blvd., Chicago, Lt. Col. Charles G. Fina
 • Detroit: Kalamazoo 7-7111, Ext. 65106, Wright-Patterson AFB, Dayton, Maj. Lawrence H. Prugh
 • Denver: Webster 5-8710, West Warren and Longo Aves., Denver; Col. Rayell Keller
 • Ft. Worth: 72185 Government Aircraft Plant No. 4, Col. Beverly H. Wimber
 • Los Angeles: Prudential 4711, 135 W. Washington Blvd., P. O. Box 1849, Terminal Annex, Los Angeles, Brig. Gen. Thomas H. Chapman
 • New York: Whitehall 4-1630, 87 Broad St., New York, Brig. Gen. Arthur Thomas

• San Francisco: Operating at the San Francisco office over a year ago at Oakland Municipal Airport, a year ago, San Francisco, to serve northern California, is now successful that additional area offices are being opened. And it is now in the function of the plant representatives at engine strength contractors' plants are being headquartered to assist other contractors in their distribution areas.

A new area office has recently been opened at Cleveland, at 1715 Euclid Avenue (Telephone Chevy 7-9800), which is attached to the Detroit office. The Cleveland office now handles the northern Ohio region, except for the city of Toledo and vicinity, which still reports directly to Detroit.

Further decentralization in the near future is expected to result in establishing other offices at such cities as South Bend, Milwaukee, Minneapolis, St. Louis, Wichita, and Omaha, in the Middle West; perhaps West Lynn, Mass., and Rochester in New York; and other cities in other areas as needed.

Some idea of the extent of the planned expanded field office program may be gained from the following partial list:



NEW GREER TEST MACHINE
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Ignition Systems

Low tension ignition systems in aircraft mean less spark plug erosion, longer maintenance free operation, fewer airline delays, and less fuel-over at high altitude. For these reasons, low tension ignition is meeting industry-wide acceptance.

However, regardless of the type of ignition system used, there is one test machine that will test either high or low tension magneto and ignition system accessories. That machine is the new Greer Hi-Lo Magneto Tester, Model 300-2.

Fully equipped with an infinitely variable speed drive and controls, adjustable spark gap banks and coil banks, aircraft vacuumum and other necessary components, this machine is precision-built to indicate at a glance whether the magneto and ignition system components are fit for flight or in need of repair.

Cold start delays and engine malfunction due to ignition system troubles will be greatly minimized or eliminated if you equip with a Greer Hi-Lo Magneto Tester.

For complete details on this and other Greer Test Machines, write today for your copy of the Greer Catalog.

**SALES REPRESENTATIVES IN
ALL PRINCIPAL CITIES**



figures of the AMC Directorate of Program and Industrial Planning. Of a total strength of 8180, military and civilian, 2660 were assigned to field establishments.

Most of a field officer is to establish contracts after they have been executed at AMC headquarters, but this involves a number of other tasks. Quality control of the products purchased is supervised by contractors. Inspectors are responsible to Air Force inspectors. Local contacts with many companies who are seeking Air Force business for the first time is made in the field offices.

Field inspectors for the Industrial Planning division keep a close check on status of facilities and industrial needs, assess potential in each area and properly monitoring as represented in the field. A few field offices which have principal aircraft plants in their areas maintain a field inspection branch, which conduct flight tests for new aircraft purchased or used government planes that are reconditioned under contract.

► How They Help—You probably would like to know how a small manufacturer can save money by using the regional field offices or sub-offices.

In the first place, it is not necessary for you to go all the way to AMC headquarters at Dayton to find out about invitations for bids and contract awards or to qualify in a USAF source of supply. Representatives in each field office are there to help the contractor in these performances. And bids of bid invitations, and other bids of unusual interest, are passed to each inspector.

Sample contracts are available. The contracts are specific for manufacturers in that you, as a manufacturer, can see whether you want to enter competition on a specific item. If you do, and have qualified as a source of supply, you are instructed to write in your bid for your own to Contracting Officer, AMC Wright-Patterson AFB, Dayton, Ohio, Attention: MCICPFSN72.

If you get a contract, you will have further dealings with contract officers at your field office. They supervise each contract to completion or termination, interpret contract clauses, and settle disputes. USAF pays its contractors according to contracts, depending on contract terms. Settlements are made in either as several times a day.

Quality control of the products bought by the Air Force is one of the biggest field office assignments—approximately half of the field offices concerned are in some place of quality control or inspection. Decentralization has the benefit of involving the manufacturer's inspection force and spot-checking it. A ratio of one USAF inspector to 20 company inspectors is common after a plant inspection system has reached a point considered generally satisfactory.



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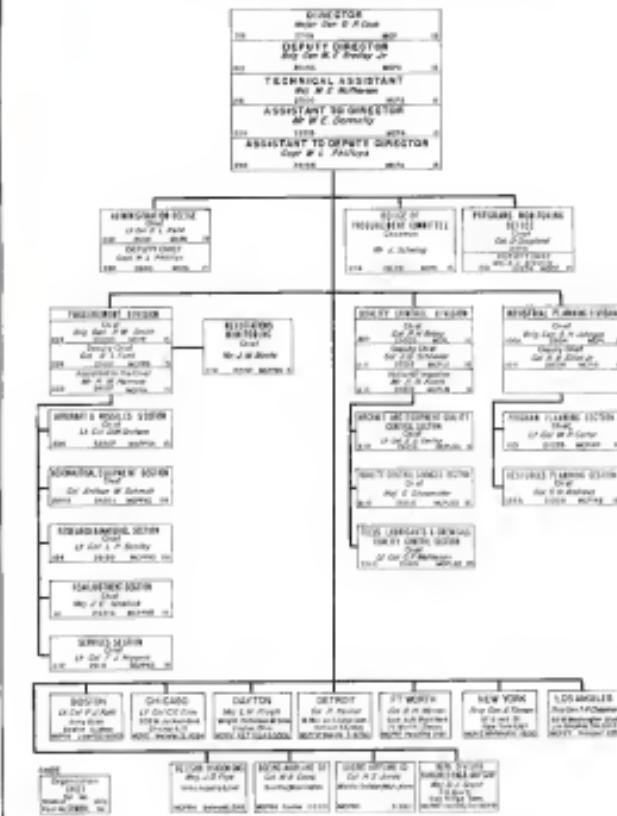
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Dayton—The biggest aviation buying job since World War II has just been issued in the lap of Air Materiel Command, purchasing agent of the Air Force.

It's a tough test of the industrial planning which has been developed in the past few years. But because of up-to-date arrangements like the mechanized bid system, and specific industrial mobilization plans for big planes and equipment to be bought, AMC is in better shape to do the job. Top-level AMC generals say that the buying mission is much better equipped to handle this volume of buying now than it was even at summit as one or two years ago.

But if you are a small manufacturer with a product to sell to the Air Force, you will find it harder to get started selling in spite of all these improved buying techniques, and despite the fact that the Air Force is eager to buy.

► **Lagging**—Most of your problems stem from the fact that there are thousands of other small business men who want to sell to the Air Force now, and they all seem to be putting on a marketing campaign.

The result is that both in Dayton and at the procurement field offices of AMC, the Procurement Division personnel are busy, busy, busy, with record inquiries from customers.

But you really want to get Air Force business yearly, don't you? And that initial lagging will soon get yourself improved for the build-up that's due, which you are equipped to make or strengthen you can provide.

To get yourself listed you must let your customers, the USAF, know that you have something to offer. Write a letter to: Commanding General, Air Materiel Command, Dayton, Ohio, Attention: MCPINNS72.

(Actually, of course, Lt. Gen. L. W. Chidlow, the commanding general, doesn't ever see your letter, but just the same, that is the proper AMC way to do it.)

In your first letter ask for catalog of specific items you would like to make. You will receive a little later your catalog, listing in great detail the sub-contractors and subcontractors of whom whom you have indicated you want to do business. You can check the catalog and read these, back together with information about your place of your facility, facilities etc. And that does it. Your buyers are, unfortunately, very fussy: they go into the Air Force catalogs with the names of about 15,000 other manufacturers. Many names are listed many times for different items. The total list of suppliers of various items amounts to over 15,000 different listings.

Once you get your name on the list, you can sit back and wait for the Air Force to let you know that it is about to buy an item that you have selected you can make. But, if you want to get some government business quicker, you can always make a formal statement of objectives which will be reviewed within the next few months (page 85).

► **Seleclivities**—It is an advantage to have your name on the Air Force's name

list in a subcontractor, 800. Often a prime contractor will ask the Air Force for a list of firms who are sub-contractors. And frequently the Air Force will suggest to a prime contractor that he subcontract a portion of his contract, and will supply a list of subcontractors for his guidance.

But there is still no substitute for sales effort. Most good subcontractors get started and keep going by selling their production capacities to the prime contractor in their actions directly, and you should not overlook this.

Negotiated contracts include those with major defense producers, for instance, which generally are of high dollar volume than the smaller part class of maintenance parts or minor operations equipment.

Analysts show that the Air Force does a much larger volume of business annually in dollar volume and in number of contracts by negotiating contracts than it does by advertising.

Here are some figures showing the distribution of contracts:

► In fiscal year 1950 dollar value of contracts let by government advertising amounted to \$92,210,778 as compared to \$87,367,078 let by negotiation. This represented 3483 advertised and 7349 negotiated contracts. The total list of suppliers of various items amounts to over 15,000 different listings.

► In fiscal year 1948, government had contracts had a dollar value of \$81,127,988 and numbered 4178, while negotiated contracts had a dollar value of \$1,273,741,016 and numbered 5425. Ratio was 54 to 56 percent.

It is easy to understand how the dollar volume of subcontractors let by the prime contractors for the 7349 negotiated contracts in fiscal year 1950 could exceed the dollar volume of the adver-

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and bid contracts. And this confirms, of course, the importance of thorough coverage of your subcontracting opportunities.

► **Research Work**—Perhaps your organization has some skilled scientists or engineers available in research work. If that case, there are opportunities for Air Force research and development contracts for you to investigate. Once again the first step is to get your firm's name on a list of potential research contractors.

The time, with no Contracting General, AMC, Wright-Patterson AFB, Dayton, Ohio, Attention: MC/PFAG 2.

Send brief biographical information on your leading research personnel, information on your facilities and previous research work your organization has done, and if you have a booklet about your company's work include it. Later it may be advisable to follow up this preliminary interview with a personal visit, if you make an appointment in advance.

Problems of "qualified products" often enter selling to the Air Force in many cases, and if you are a new kind of Air Force procurement business, that is something else that you should know about.

► **Product Qualifications**—Air Materiel Command has established standards or qualifications for many of the products it buys, and requires them in their contracts to meet these qualifications, before they can be bought.

When you want your catalog of products which you wish to make, you may find that some products which are "qualified" in this case, AMC will send you a list of specifications for the qualified products, with instructions on how you should take qualification tests.

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Manufacturing and procurement contracts let locally by individual military installations should advise the commanding officer or the contracting officer at the base listed below, stating the particular item they can supply.

Instructions to bid, and the procedure to receive these instructions, will be made available at the time it is done at Air Materiel Command headquarters and Bureau of Aerodynamics headquarters.

These regulations make local purchases (the last was compiled in October, 1949) and bid lists basis which have been so designated:

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- Craig AFB, Selma, Ala.
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- Larson AFB, Ft. Boeing, Ga.
- Wurtsmith AFB, Alpena, Mich.
- Holloman AFB, Alamogordo, N. Mex.
- Walker AFB, Atlanta, Ga.
- Drew AFB, Roswell, N. Mex.
- 27th AF, Air Test, Tog, Ellsworth Airport, Brookings, S. Dak.
- 160th ATW, Waterton AFB, Cheyenne Falls, Mass.
- AF Cambridge Research Laboratories, Cambridge, Mass.
- Groom AFB, Manchester, N. H.
- 1701st Air Transport Wing, Great Falls, Mont.
- Pipe AFB, Ft. Bragg, N. C.
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- Wright-Patterson AFB, Dayton, Ohio
- 501st AF Supply and Depot, Washington Park, Indianapolis, Ind.
- Lockbourne AFB, Columbus, Ohio
- 511th AF Supply and Depot, Shirley, O.
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- Headquarters, 11th AF, 1610 E. Boulder St., Colorado Springs Colo.
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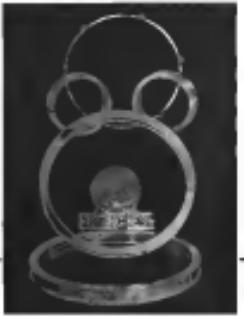
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Property Classes

United States Air Force largely as of
 causing of its widely scattered physical
 properties by excess of which is
 included in the classification of
 aircraft and missile parts, the system
 is clearly based.

While space does not permit listing
 of the complete classifications listing
 here, the basic property classes are
 shown as a service to manufacturers as
 tested in USAF procurement. Many
 factors should know the property class
 in which his products are
 placed, and related classes.

USAF Property Classes

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 plete aircraft as in sub-class 01-A, and
 complete aircraft as in sub-class 01-B. Other
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 all" class of special purpose subassemblies
 and armament parts. 03-A, aircraft armament
 and accessories, and 03-B, aircraft
 armament parts. 03-C, aircraft car
 busters and parts. 03-E, high-speed projectiles
 and parts. 03-F, miscellaneous aircraft ac-
 cessories ranging from aircraft limiters to
 nose wheel stops, 03-G, aircraft armament
 and accessories, 03-H, aircraft armament
 and accessories, 03-I, aircraft armament
 and accessories, 03-L, aircraft armament
 and accessories.

- Class 04: Aircraft hardware, rubber prod-
 ucts, bearings.

- Class 05: Aircraft instruments, including
 navigation, light, engine, and miscellaneous
 instruments and parts. The class also in-
 cludes electronic parts and gyro control
 mechanisms.

- Class 06: Parts, bolts, hardware and
 parts.

- Class 07: Drapes, prints, cloths, con-
 crete, rope, twine, glass, wire, etc.

- Class 08: Consumer electrical equip-
 ment and supplies.

- Class 09: General freight and general

- Class 10: Photographic equipment and
 supplies.

- Class 11: Aircraft armament, including
 bombing equipment, fire equipment to
 tanks and shockers, gunnery equipment,
 torpedoes and related models.

- Class 12: Fuel and oil handling equipment.

- Class 13: Special purpose clothing and

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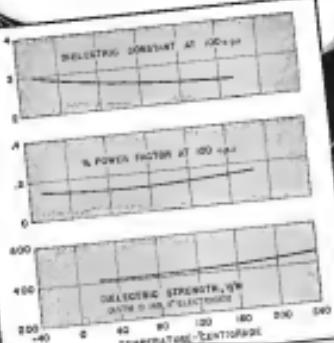
Available in all standard strengths,
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 diameters up to 12" in. dia. and other
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Meet current AFM specifications
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why SILASTIC* works best



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from -100° to $+500^{\circ}\text{F}$.

Over half a century ago only Silastic, the Dow Corning silicone rubber, remains resilient and retains high resistance to stretching, moisture, oxidation and ozone. Add good dielectric properties to these advantages and you have the reasons why Silastic is an excellent insulating material for high temperatures. Single twisted cable and flat or round equipment cable and cord for use in equipment where insulation breakdown limits the effectiveness of conventional insulation materials.



Silastic® is extruded over wire and cable ranging in size from No. 10 to 100,000 circular mils to provide insulation at temperatures from -30° to $+500^{\circ}\text{F}$.

Many engineers and founders work with Silastic as a remarkably bearable and self-reinforcing insulating material for use between -30° and $+300^{\circ}\text{F}$. Silastic as a dielectric for insulation and interconnection cable and for field and structure coils is, however, a relatively new development. That's why Dow Corning has made available reprints of a series of papers that may be the most up-to-date information on the physical, electrical and dielectric properties of Silastic. To receive your copy, please the nearest branch office or write the Reprint Dept. No. D-101.

* U.S. REG. U.S. PAT. OFF.

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passenger equipment, including passenger-carrying vehicles, oxygen tanks, flying suits, etc.

- Class 14: Subsonic 14E, parabolicized hangar and buildings
- Class 15: One-engine installations 100 ft. for field changes in altitude, engine, compressor, etc.
- Class 16: Communications equipment, including airborne and ground radio and radio and parts
- Class 17: Stage and workshop machinery, tools and equipment, including power tools, hand tools, and tilt and turn-over equipment
- Class 18: Special tools, calibrating equipment, dies, fixtures, fixtures
- Class 19: Flying field and hangar equipment, vehicles, check boats, etc.
- Class 20: Aerial delivery equipment and protective covers
- Class 21: Cordage, fabrics, fabrics
- Class 22: Bulk lumber, rock, plywood, insulation
- Class 23: Bulk metals and composite materials, including sheet, tubing, wire, wire, monolithic resin, fiber, glass, plates
- Class 24: Chemicals
- Class 25: Office equipment and supplies
- Class 26: School school equipment
- Class 27: Eatery and angles property
- Class 28: Instrumentation equipment and housing units
- Class 29: Hardware and miscellaneous supplies
- Class 30: Publications, drawings, black boards, training films
- Class 31: Foreign aircraft, related equipment and material
- Class 32: Aircraft and equipment for research or historical purposes
- Class 33: Miscellaneous items and equipment—posting passes, refrigerators, stoves, grills, ovens, dishwashers, cleaning supplies, newts, books, bags, art, dental, medical and optical supplies.

Metal for Wood

A growing market in the Air Force is for metal engine cowlings. The service is shifting from wood to metal cowlings at first at a time.

And although the original cost of a metal cowling is higher than that of a wooden box, USAF saves in the end. At the hearings on USAF's fiscal 1951 budget, Brig. Gen. J. F. Early, AMC chief of staff, estimated the cost of a metal cowling for an R-4360 engine at \$383. A wooden box for that same engine would cost about \$500. But maintenance of an engine in a wooden box costs \$25 a hour if the engine is in a metal cowling, cost is about \$16 per hour.

The Air Force says it hasn't been using the metal cowlings long enough really to establish the life of the cowling. But in 1947 it took some engines in metal cowlings and put them in an open field. Two years later the boxes were opened and the engines were ready for immediate use.



The new high performance, easy-to-fly Bellanca Cruisemaster is **powered by Lycoming**. This popular plane offers many outstanding features for safety and economy—quick take-off, low starting speed, fast climb, and high cruising speed. Its sturdy Lycoming O-435-A engine provides steady, dependable operation for smooth, quiet flight—with a high factor of safety. And once again, Lycoming's creative engineering and precision manufacturing result in unusually low engine maintenance requirements.

The Cruisemaster's power plant is an improved version of the same rugged, 140-horsepower Lycoming engine that powered the famous Lig-Lasto Planes under the roughest conditions in every war theatre from the Arctic to the Tropics. You can be sure of your plane when it's . . .

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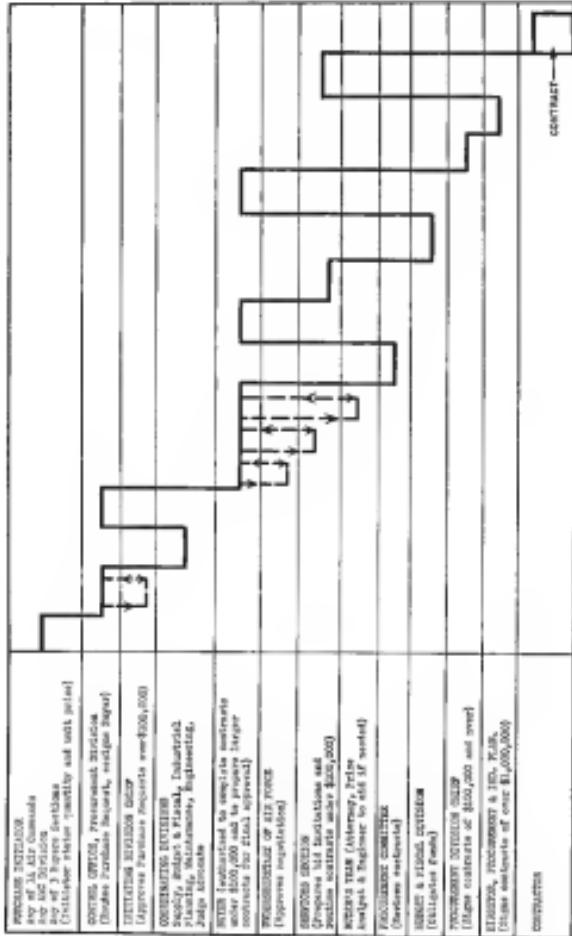


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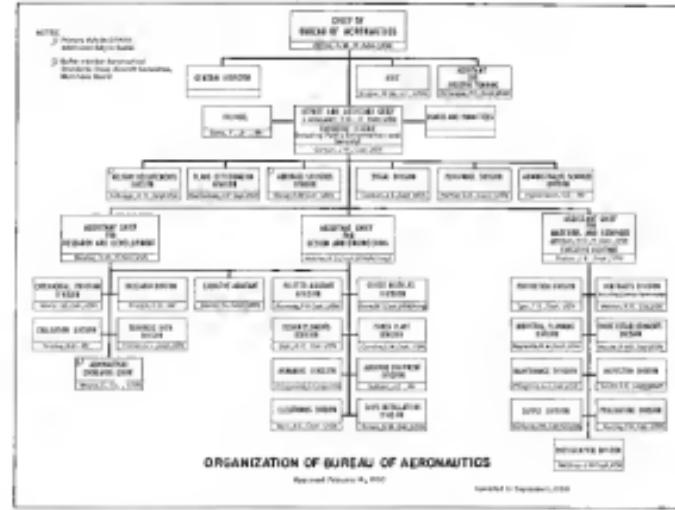


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PAINTED METAL PARTS • RESIDENTIAL AND COMMERCIAL ROOFING • STEEL PLATE EXPANSION • DAY AND NIGHT

How USAF Purchase Requests Become Contracts



SELLING TO THE NAVY



How the Navy Plans to Spend \$2.3 Billion

You deal with the Bureau of Aeronautics if you have equipment to sell for the 30000 new-plane program.

The shift forced an overall U.S. defense strategy by the Korean conflict has given renewed importance to Naval and Maritime-oriented Homeland Security.

in a triple plane procurement budget. Navy Secretary of Ammunition now has more than \$2 billion to buy a total of 3374 fighters, attack planes, patrol bombers, transports, helicopters and trainers.

Spurred by the Korean conflict, and in light of a changed international situation, the Navy \$750 million for 1953 aircraft, enough to maintain 1,700 aircraft in the air. Impact of the Korean conflict and the resulting \$200 million supplemental budget give Navy an additional \$100 million for aircraft procurement.

Under the President's supplemental bill, Navy was authorized to procure 1867 aircraft, which left Naval air craft 485 planes short of the 1950 approved procurement program and about 1000 aircraft short of the 1951 approved procurement program.

Naval air power 160 percent modernized.

the Navy Air-Decision for the annual \$950-million budget, ensuring an agreement by the Joint Chiefs of Staff that Naval aviation

should be maintained in the area "state of relative calmness" as the Air Force. Current procurement programs of both aircraft were to base on the same rate of modernization, the JCS said. This denotes the JCS permits Navy to approach maximum efficiency with sufficient planes on order to keep Naval air power 100 percent modern. Under the President's supplemental last, Navy was authorized to procure 1961 aircraft, which left Navy at craft 455 planes based upon the 1950 agreed procurement program. The 1960 spending measure leaves the 1949 program. The second supplemental provides for 1930 additional aircraft, leaving Naval air power close to its maximum end.

Expanded Procurement—Expanded Naval procurement of aircraft for fiscal '51 is controlled by the Bureau of Aeronautics in Washington. It is

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Small quantities available at low cost due to special
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Laminated shims are stamped from sheets of LAMINUM™
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directed, as in the past, by a three-
pronged effort of Research and Develop-
ment, Design and Engineering, and
Material and Services division.

► **Research and development.** Under regular 3351 funds Navy was budgeted a total of \$199,269,000 for research and development. Of that amount, aircraft and facilities have totaled \$73 million. As a result of the revised '51 budget, basic and supplemental research and development will be reduced to \$128,753,000 and aircraft and facilities get \$102,768,000.

The result is that Navy, faced last year to a cutback across the board in research and development, is once again pushing for prototype development of new jet and bypass aircraft, as well as increased emphasis on guided missile development.

► **Design.** Procurement-Procurement under Bureau of Aeronautics generally works in this fashion:

► **Experimental contracts.** The Research and Development division is headed by Rear Admiral C. M. Bohm. He is in charge of all experimental programs. Contracts for research and development fall into two groups—research contracts (those with no end product to flight) and development contracts (those which will call for flight and production).

► **Development contracts.** Design and Engineering division is headed by Capt. R. S. Haskins. This division formulates the program for development of specific items required in a large scale production program. Avionics, electronic equipment, powerplant and airframe equipment are among the items controlled by Design and Engineering division. Each branch division has own individual requirements for item equipment.

► **Material and services.** When specific requirements have been crystallized, they channel through Material and Services division, headed by Rear Admiral W. D. Johnson. The division coordinates all actual procurement in the form of directives open to contractors at Chief of Naval Operations. These procurement directives become, eventually, the sought-after Naval procurement contract.

Boeing in Washington is the prime agency in buying Naval aviation's planes, powerplants and accessories. It coordinates procurement and other GPO (government furnished property) with the Naval Aviation Supply Office (NASO) (see page 51) buys all spare parts and raw materials required in the Naval aviation maintenance program, and makes sure maintenance parts specify necessary for specific plane types.

Most Naval air procurement is accomplished through negotiated contract. Procurement of items such as aircraft, engines and propellers, is based upon recommendations of special

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Our business is everybody's business

America is involved in another emergency, and the nation is gearing for national defense. And once again, industry is demonstrating that the task of building materiel for our armed forces is not confined to a few major contractors. It requires teamwork by all kinds of industry — large and small. National defense is everybody's business.

Nowhere is the need for such teamwork more clearly recognized than in the aircraft manufacturing industry. But it is not teamwork desperately assembled at the beginning of a crisis and quickly disbanded when the crisis is passed. It is practiced in peace, as well as in time of emergency.

For example, Chance Vought Aircraft has been in the business of building military airplanes for more than 30 years. And in all that time it has fostered, as a matter of policy, a close working relationship with a large family of allied companies — large and small, but mostly small. They feed into our plant expertly-made components which we incorporate in the finished airplanes.

Some of these companies make such major items as valves, pumps, moldings, plastics, castings, landing gear struts, forgings, and hydraulic assemblies to Vought's designs. Others supply so-called "government-free-

nished equipment," which includes engines, propellers, radar, cockpit instruments and all kinds of electronic equipment. Still others fabricate standard aviation products — sheet stock, rivets, machine screws and many others. We also buy goods and services, from electrical power to paper clips, essential in the operation of any business enterprise. Each company, therefore, is an integral part of Vought's business, however small its participation may be.

By spreading work among a number of companies in peacetime, Vought remains smaller than it would be if it were manufacturing about everything it needs. Therefore, its expansion or contraction as dollar volume of sales fluctuates, is not drastic. And since Vought is not the only customer of its subcontractors and suppliers, these companies are not seriously disrupted if our business slackens off.

In a national emergency, such as the one we are now facing, this kind of teamwork with little business really pays off. With such a dependable network of skilled subcontractors and suppliers, Vought is equipped at all times to handle, quickly and efficiently, any task that might be assigned by the military services.



The network of companies, large and small, which finds products and services from Chance Vought is nationwide.



Chance Vought is an important customer of more than 2,000 subcontractors and suppliers throughout the nation. Most of them are small, employing from 50 to 500 persons. Others are large, some much larger than Vought. Each has a product or special skill we need to help us manufacture aircraft, defense, precision products for modern, high-speed aircraft.

If you want proof of the interconnectedness of large and small businesses, take a look at the financial side of the picture. Of every dollar received by Vought for airplanes, more than 32 cents is spent for the products of other companies — mostly small ones — on our production team. The amount paid out last year totaled many millions of dollars.



Companies which do work for Vought are subject to extremely fine tolerances on some products. It is a matter of record that many of these companies, having earned reputations for quality production in aviation, are eagerly sought out by association manufacturers who want the same quality. This helps them to prosper in peacetime, and preserves skills and manufacturing techniques essential to our national defense in an emergency.

CHANCE VOUGHT AIRCRAFT
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ONE OF THE FOUR DIVISIONS OF
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Model "L" The Hardest Hitting Cecostamp Ever Built



Wider Range of Work:

The Model "L" Cecostamp can handle a wider range of work than previous models. This increase in striking capacity is effected by increased ram weight.

Easier Operation:

Concentration of controls makes the ease of operation. Working area has been cleared of obstructing surfaces. Operating valve handle and control valve handle, worked together, run the Cecostamp and keep the operator safely poised for quick, accurate blow control.

More Accurate Valve Parting Operations:

Valve parting gives smoother, smoother action, making it possible to strike harder blow regardless of the height. The steel bolter plate makes for rapid die changes and more accurate setting of dies.

Greater Safety: Operational hazards have been largely overcome. Controls are centralized for safety and ease of operation. Frame-to-axle bolts and springs are recessed in the serial, avoiding hazards to clothing. A safety cylinder head prevents damage from parts over-travel. Positive self-locking safety nests built into the nose frames between the guides, hold the ram when changing dies or working between dies. Operating valve handles must be held down before throttle control valve can operate.

Lower Maintenance Costs:

The Eccentric parts of the frame-to-axle joints, eccentric lubrication of valve, cylinder and guides, eliminates the life of these parts. Lubrication turns on automatically as soon as machine is operating. Valves are cast integral with the yoke, eliminating piping and air losses.

Write for a copy of Bulletin 302-C



Rear Admiral S. E. McCarty



Captain F. L. Hitter



Commander H. F. Koch



Captain F. W. Blaser

Your Navy Market for Spare Parts

Buyer decides what planes will be bought. To sell replacement items for those planes, talk to ASO.

Navy buying for new plane or plane, engine and accessories is the next 15 months is going to multiply.

Plane orders scheduled for fiscal '51 are far above last year's.

And maintenance spare parts procurement will jump even more:

- Supply Depot-The Aviation Supply Office under the Navy's supply of spare parts for aircraft, plus standard Navy hardware. It is located at the Naval Aviation Supply Depot at Philadelphia, and is under the command of Rear Admiral S. E. McCarty, SC, USN, who is supply officer and his department, Captain F. L. Hitter, SC, USN. Admiral McCarty is also the commanding officer of the NASD, and Captain Hitter is the executive officer Commander H. F. Koch, SC, USN, in the ASO executive assistant.

Responsible for maintaining proper stock levels of standard Navy commercial items in the General Stores Supply Office, commanded by Captain F. W. Blaser, SC, USN, also located at the Naval Aviation Supply Depot. Most of these materials are processed through the ASO Purchase Group, Capt. F. W. Blaser, SC, USN, is in charge.

Total ASO-administered business this fiscal year will exceed \$100 million. ASO has two authors that are say other Navy supply field organizations. It makes about 90% of the parts procurement decisions in Naval aviation, based upon Bureau of Aeronautics delegated authority. Other Navy supply field offices make lesser decisions.

Buyer says that for the aviation supplier will be in negotiation contracts. But public bid contracts will jump too, for aviation spares and general Navy hardware and consumables.

- Spares Parts Job-The three main functions of ASO on spare parts are now:
 - Procurement: spare parts for new

planes. ASO orders the parts for all new Navy planes and engines.

- Repacking: spares for Navy planes and engines now operating.

- Single-service buying for Air Force and Army for certain commodities.

In spite of the big increase in new

ASO Buying Activity

Who buys what, how much, and on what type of contract.

ITEM	HOW BOUGHT	FISCAL 1950 CONTRACTS
------	------------	--------------------------

(Procurement—Buying by Purchasing Controller Due Date for new planes, engines.)

Aircraft	Negotiated, prime	\$33,451,356
Engines	Negot., prime	46,476,808
Boats	Negot., prime	8,352,659
Accessories	Buy, vendor	1,051,442
(Procurement)		
Equipment	Negot., vendor and bid, vendor (instruments etc.)	3,461,307

(Annual Maintenance—Buying by Purchase Officer O. W. Bradford for Stock Control.)

Aircraft	Negot. or bid; prime or vendor soleligibly supplying usually within contract	7,750,809
Engines	x x x	11,530,800
Boats	x x x	6,612,800
Accessories	Buy, vendor (standard)	62,383,800

(Navy Hardware, etc.—Buying by Purchase Officer O. W. Bradford for General Stores.)

Hardware and use materials	Modif. bid	66,808,800
Manufacture		45,656,800
Total ASO Procurement Responsibility		\$280,716,500

* Airframe procurement here usually includes electrc, etc., parts peculiar to type.

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DYNAFOCAL
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We believe the new Capital Airlines Constellation is the world's luxury aircraft. Passengers enjoy a new sense of luxurious comfort in their ride in the famous "Cloud Club" of the world's most famous airline.

Men do not know that much of their comfort and pleasure depends upon the skilled engineering that preceded the Dynafocal. Engineers have found that passengers like freedom from vibration of powered engines. But they do know that they are enjoying the most pleasant and most relaxed of travel.

LORD engineers specialize in audio-aid for car-rolling vibration, vibration and all other types of mechanical vibration. They can make your product more comfortable and more reliable by giving it smoother, easier operation. Without details of your problem, Product and Sales Representatives.

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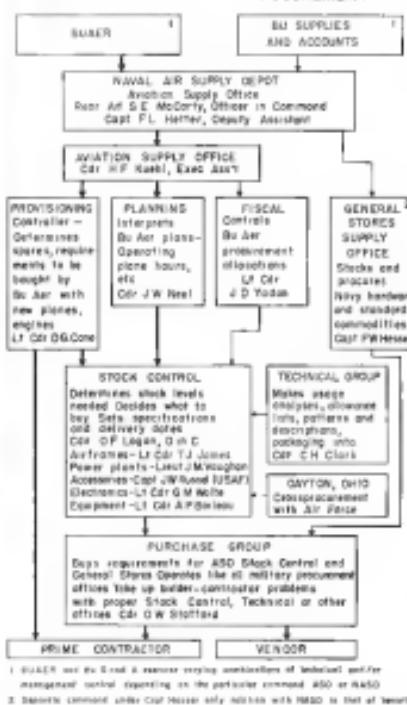
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1. BUAVER uses the BuAer & Aviation Supply Procurement of Industrial and/or Management control, depending on the particular command, ASO or NADS.

2. BuAer command under Capt House info notice with NADS is that of BuAer.

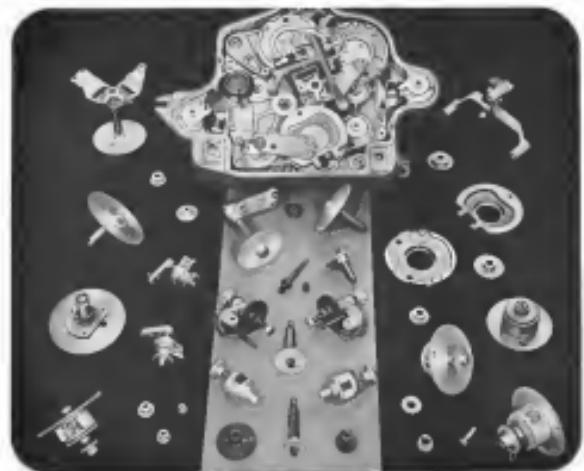
plane procurement and provisioning, ASO won't be buying much on an emergency basis. This is often just as important. Engines and accessories procurement will be stark. So, while ASO may want early delivery on many negotiated purchases, it won't be ready to pay high prices. BuAer and ASO have reviewed their supply setup more than once, and find ASO as bad supply problem. ► New Fleet Spares—ASO has projected a system of buying lines price comparison enough space with the original

airframe to maintain a dozen or so placed spares. This is called price setting. Engines and accessories procurement is similar, but for shorter period.

The story of provisioning, the Douglas F4D Skyray (first contract pre-completed) shows how provisioning can be refined and integrated by Procuring Controllably from Cross Weeks.

In September, 1948, Butler sent a letter of intent to Douglas for development and production of 25 jet night fighters, designated F1D.

In a "control unit" the need for PRECISION points to STEEL PRODUCTS ENGINEERING!



from the
smallest gear
to the
largest assembly

For a precision assembly such as this control unit, for aircraft and similar mechanisms of intricate parts—gears, cams and differentials—must be built to exact tolerances. Aircraft engineers know they can depend upon Steel Products for the precision workshop equipment required in design, manufacture, assembly, and testing of complex units like this. For precision aircraft manufacturing, or aircraft or other industries, send your inquiry or blueprint for quotation, or write for booklet showing plant facilities.

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PACKARD HIGH-ALTITUDE AIRCRAFT IGNITION CABLE

Years of leadership in cable development and progress has resulted in Packard becoming the standard cable in the aviation industry.

It is no secret that Packard high-altitude aircraft ignition cable gives unparallelled resistance to heat and cold, moisture and abrasion, age and extremes under all atmospheric conditions—from sea level to ceiling—in all parts of the world.

It is well known among owners of all types of planes that Packard aircraft cable gives more hours per replacement.

Packard

PACKARD ELECTRIC DIVISION
GENERAL MOTORS CORPORATION
WARREN, OHIO



AVIATION SUPPLY OFFICE: Behind the door lies a half-billion dollar market

called for delivery by September, 1950. Spare parts for aircraft delivery by Douglas were budgeted at 25% of total contract value. This was the budget. But after long discussions and negotiations, parts produced (parts for necessities and optional) should not exceed 10% of other type aircraft parts.

Because this unusual FID program never was before Kress, the parts were to be of the type for maintaining the plane through a positive operating life. That means about 70 percent of spare parts cost was for non-necessities requirements and 70 percent for optional. Warman, quite prudently, makes the quota for non-necessities parts (like exhaust pipes, tailfins, shored assemblies, etc.) but outshipped them (like flaps and casting) in needed in fair quantities. That is because when planes are flying their maximum requirements are much greater, but these planes get back home, so less overhauled parts are needed per new plane produced.

► **Planning Spares**—Following the pre-

cisioning list, the first FID started

well before completion of engineering drawings. The idea was to get a guarantee of spare manufacture and delivery with enough advance time to save on cost and time.

One month before completion of drawings (February-March, 1949) Kress called a full scale meeting of his FID procurement team. The team included the procurement personnel of ASO, factory and field engineering, activities plan, fleet operations personnel, and Douglas and its vendors.

► **Procurement Team**—First the team coded every part of the aircraft and accessories (GLE80 items), even Warman's 95 percent completed. Then the team issued replacement site per operating plant hour (OPH) on a categorical replacement schedule 2800 (Maintenance and overhaul parts as well as repair, tools, design parts, etc.) or 1500 to be supplied from manufactured plants. Then the experts decided who should supply what again (O&R, Navy

manufacturer, prime contractor, etc. etc.).

ASO set the number of each type needed per plane. Stock Control took account of spares but from records on previous FID life and deployment of the plane, according to how many hours were used. ASO Planning Office is busier than ever.

By late March, 1949, ASO had issued a complete spare parts list. Douglas then started production on the prototype. Full parts list was not manufactured, however, for Spec 366, three service runs and two major overhauls, which was the planned life and deployment. (See chart, page 57.)

Over the next 12 months, procurement schedules were under frequent revision. About June, 1949, Kress called a final team meeting for the 25 plane contract. This was three months before delivery of the 25th plane (delivered at three planes per month).

► **Report**—Complaints before ship completion of the first FID 1, Douglas got a contract on September, 1949, for 70 more FID-2s. The fast increase of 20 was to start ship deliveries within four months, by January 9, 1950.

The new contract called for regular item delivery, by Douglas and Wilson, Inc., spare parts with their 70 planes. That meant a procurement team would have to meet in November two weeks before starting the aircraft. The team convened and waited for ten days, planning spare parts of tomorrow and today, the manufacture and delivery schedules.

So right now, every group of Sky Kings, de Havilland, Martin, and a list of names originally dedicated to winning the group's flightline. The spares are now considered as much as the aircraft itself.

The ASO procurement scheme had to get more cooperation. Some contractors said the Navy planes could not succeed in their use. But they are all for it now.

Here is how fine the procurement service can get. Not long ago the Au-



meeting your needs with proved...

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AUXILIARY POWER UNITS



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These are but a few of the types of aircraft electrical equipment now in production at J & H. They're units we've successfully developed and engineered...based on your demands—for smaller, lighter, more dependable packages of power.



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Relays FOR AIRCRAFT



DOUBLE POLE - DOUBLE THROW

A-319 - BALANCER TORQUE DESIGN
MS Complete: 300 Volts continuous.

Relay design incorporates the simplicity of the standard full metal relay assembly, producing maximum resistance to shock, vibration and acceleration. The relay is designed for aircraft applications. Rated also in two types of the A-318, shown below.

12 Amps.
500V
100V
50V
25V



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Electrical Products Corporation serves the Aircraft Industry with highly specialized electrical parts engineered by an expert staff and manufactured to the highest quality control area of the aircraft manufacturers in the West. The organization is available for solution of difficult problems in electrical design.

Scope and breadth of experience and manufacturing facilities are indeed

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ASD Purchase Group awarded 15,000 contracts totaling over \$200 million. About 50 percent of this was in negotiated contracts, the rest publicly advertised competitive bids. The total for fiscal 1957 should exceed the amount with some increase in negotiated contracts.

Pearlman Group buys three general categories:

- Almost all aviation spare parts for restructuring. (This is to maintain originally purchased inventory of spare and accessory spares at one year, and to build up aviation spares where unique procurement was inadequate.)

- All common standard hardware and commodities for Navy (General Stores), except chemical, textile, office supplies, lumber.

- Corrosionary single-service purchase items, like paint, marine cleaning equipment, etc.

- Corrosionary single-service procurement of spares.

Plans needed quick-Korea war outfitting and a big jump in the procurement budget gave ASD a test. This was the first emergency load placed on Naval systems since it was fully integrated at the end of the war.

Here is how changing world conditions work through to changes in Navy procurement needs, and how ASD meets them:

The Korea emergency meant a big change in U. S. strategy in of June 27. Going on a war footing meant many procurement parts needed.

The Carrier shielded as these Komodo ships were built. Carrier squadrons sent direct to the Pacific. It also means a whole new plan of Carrier deployment at home and abroad for some time to come. That changes the supply picture.

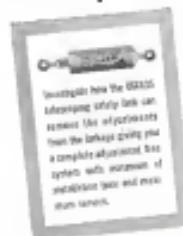
The chain of events leading to fiscal 1958 Comiso spare parts contracts is this:

Chief of Naval Operations tells Comiso consider the Far East, Pacific Fleet and other commands the new deployment also. Comiso tells ASD Planning Officer. Now that X Comiso squadrons will go to the Far East, specifically, Y to Hawaii, etc. And Balaker tells Niel that the new deployment and operating schedule as now for the high-circumstances is first and so. Planes out there will stay out double the tour of duty they stay in, and planes will operate more hours per day.

Planning reflects this information. It turns it into analysis of operating plane hours, deployment of planes by type and numbers. The job of the planning group is to translate strategy and tactics into supply data that Fleet Control Officer Legion can use.

Now Marine Speed-Sort Stock Control now figures how many wheels the X Comiso squadrons in the Pacific will

Let the
Geneva-loc
actuator
simplify your
installation



1. Volume production means low cost.
2. Five years' use means three times tested reliability.
3. The absence of all adjustments means less service troubles.

The Standard Geneva-loc Actuator is ideally suited for installations which are used intermittently. Where more frequent operation is required, a noise-free Geneva-loc is available which will not interfere with radio reception.

Pacific Division

Pacific Aviation Corporation
1000 N. MARSH • 2000 MUSSETTE 10

Specify ...



HEAT TRANSFER
PRODUCTS

far all aircraft
applications



DEVELOPMENT ***
and
MANUFACTURING ***
FACILITIES

Every heat transfer problem receives "individual" attention at Young. His efficiently engineered by specialists... skillfully manufactured by craftsmen. You are invited to consult with Young Engineers on any heat transfer requirement.

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and Industrial Industries

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Sales Office: 100 1/2 S. Broad Street, Philadelphia, Penn.

used, and where. It also finds how many wheels the other Carrier outfit will sell and Logan's men come up with final figures based essentially on these factors.

- Carriers is advanced item will fly, later in many OPEs as they did before.
- The carriers will get into one of several forward bases.

All forward bases must stock twice as much as below, although only one of these bases will actually be down upon us at once. (Doubtless, Navy can't predict which base's carrier will stop at, so ASD must stock them all.) This inventory will be inimmovable in forward areas. It is called the "logistics supply factor."

Up to this Planning July, Stock Control that the X Pacific Carrier squadrons will go aboard ship with a Zulu allowance of space per man rated for the old Y-dash. *(And the forward bases will need Zulu space, instead of Y.)*

ASD Stock Control consent that rate two sets of orders.

• Finish a-b-c Carrier wheels immediately from 1948, from Pacific Coast depots first, and NASD Philadelphia and NASD Norfolk later.

• ASD Purchasing Group must buy a limited number of delivery Dec. 15, and another a-b-c for delivery by June 1, 1951.

This is to bring stocks up to inventory required to keep all existing Ger-

man operating tactically now and for the planned combat life of the craft thereafter. This is in accordance with the current deployment plan sent down to Planning by Air Materiel and Fleet commands.

• ASD Purchasing Group will probably negotiate a contract for the first a-b-c wheels with the vendor or prime contractor who can quote earliest delivery and a reasonable price. But on the second a-b-c wheels, they may propose and issue a public invitation to bid.

How big an operation is ASD Stock Control and Purchasing? ASD handles usual standard thousand separate items of which Carrier wheels are just one.

Right now, ASD Purchasing is out to buy enough of everything to raise its stock level of these items to approximately level as dictated by the present operational situation.

• How Long—One month after Kress, ASD Stock Control had figured its new needs for almost all items.

By way of job, ASD had already ordered items it knew would be used. And it had begun negotiations with vendors on many other items. Present stocks of all items are good for an average of one to two years.

With its big backlog demand now stabilized, ASD will buy mainly over the next 18 months. Maintenance spares will be its biggest demand.

Tips on Selling to ASD

- Follow standard procedures for military procurement actions.
- If you are not already on ASD Buyers List for items you can supply, write Purchasing Officer, ASD, Philadelphia 11, Pa., and state name of item you are interested in supplying. ASD will furnish you necessary forms by mail.
- Bid on invitations, or else explain why you did not bid. Just a post card is sufficient.
- Do not go to ASD about mobilization plans. Mobilization is handled centrally by the Mobilization Board, Washington, D. C. For Navy products, Office of Naval Material, Washington, D. C. cooperates with the Mobilization Board.
- Do not go to Washington to get ASD business. It's all handled independently by ASD in Philadelphia.
- Do not ignore delivery dates and specifications in invitations to bid, and the applies to packing and packaging specifications as well as material specifications. These are contractual obligations. They name just what they say—no more, no less.
- You are welcome to visit ASD, but if your only purpose in visiting is getting on the mailing list for bids, a letter to this effect will serve as well as a visit.

Commercial transport planes of every aircraft builder in the United States are equipped with

DYNAMIC AIR BLOWERS

... used for recirculation of hot and cold cabin air; deicing of windshields and windows; destratification in cold areas; cooling of electronic equipment, generators, alternators, voltage regulators; air sampling for fire control and thermostatic control; man-cooling and ventilation.

In 1942 Dynamic Air Engineering, Inc. designed

and perfected the FIRST AXIAL FLOW BLOWERS for use on airborne equipment,

and between 1942 and 1945 manufactured more than 50,000 axial flow blowers installed on military aircraft. Since 1942, this organization has

been on that job to the exclusion of all other types of blower equipment, and with accumulated engineering time of over 160,000 hours.



All of this "know how" is available
for the asking when you have a project
requiring airborne blower installation.

DYNAMIC AIR

MICHAIR has plowed in more than 160,000 hours of engineering — 19 years of research — plus 8 years of manufacturing aircraft blowers and heaters; all available on a moment's notice!

In more instances the modification of an active, proven model to suit your particular application problem will save days, weeks or even months of time. It will also remove most of the uncertainties which enter

More than 100 models of D.A.E. Inc. blower are in service today on commercial aircraft. They represent 10 basic models with 90 modifications to meet particular needs or specifications. A few examples of "original" and modifications are shown here. Modifications are at customer needs, as possible.



RECOIL: 1000-1200-1400
1000 lbs at 100 ft. Retarding 30°
Recoil velocity made with 100% acceleration
3,000 Gals at 40° Static pressure
Recoil 14" Weight 45 lbs
Daily maintenance

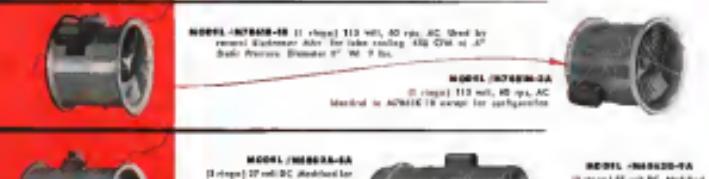
MONEL - MEAS-5A
17 mm DC Housing 37
mm diameter center, 4 per
S700-CMA, at 4" Total Flow
area. Biomass 160° Frac
Extruder Model No. 423-24



MODEL 7400A/7400A-1A
 @ 1000 rpm | 27 volt DC. Standard
 application of Model 7400-1A
 Performance Identical. Model
 7400A-1A includes a
 1000 A full-scale current transducer.

11 model EF with EC. Special information from 107442-89 for Harry F2Y supersonic L9000 Cm/s at 17° South Pacific. Maximum

Model: 1001238-04
 (2 rings) 17 mm DC Spurial
 coordination at 1001238-04
 1.750 CFM at 87° = 1,360 CFM
 10° Static Pressure: Area 0.08
 0.010 CF 100 setting of
 valve will all measure
 1.000 CFM 10° Static



輪胎規格: 4.00-8 4600-48 11.5psi 112psi, 60 rpm, 80°. Used by
various European auto. for trailer coupling. 4600 rpm at 80°
speed. Pressure: Maximum 112psi. 80psi.

Model 1027656-0A
(0 rings) 113 mm, 65 rpm, AC
Model 1027656-1A (0 rings) 113 mm, 65 rpm, AC

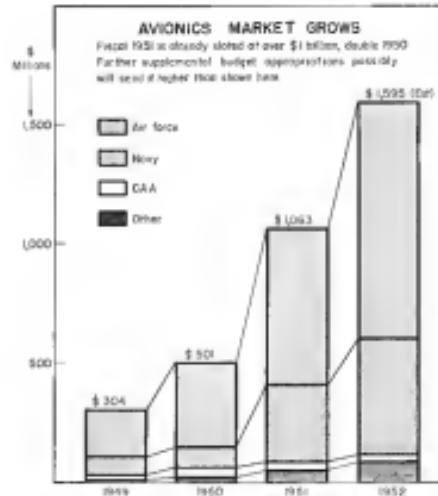


MODEL 7/7000A-5A
 [5 rings] 27 mm DC shielded for
 higher performance for TWA
 Hearing ZCT and Forearm Altimetry
 and others in C 54 measurement



Polaroid photos have one slight photograph of only a portion of the entire model available and are intended to show the maximum information available. All data subject to change without notice.

These small 2" diameter hollow core blocks can be used in many of the same ways as hollow core concrete blocks to create a lighter concrete foundation.



► Navy Spending—Navy will have about \$725 million of interests, roughly half the Air Force budget. Bunker will spend about \$250 million of that—\$175 spending for GFP for new planes, \$50 million to refurb old planes, and other surveillance spending, and about \$25 million for space parts.

Business of Ships and Bases—Of course will spend nearly another \$75 million, most of it for ship and shore radio and communications gear.

Bunker has about half its contract value to firms to firm, and that's about \$500. Bunker estimates about 30 percent of its prime contracts go to small business. So there's about \$140 million in new contracts waiting for small business.

► Research and Development—Research and development budgets for the services are secret now, so you can't tell how much will be spent overall in research and development of avionics devices. But in the supplemental Defense Department budget submitted after the start of the Korean action, that is \$140 million set aside for all kinds of research and development. It is estimated that \$40 million of that sum will go into avionics. That is in addition to routine research and development included in the regular and supplemental fiscal '53 budget.

Research and development work is wide open to small firms. If you have a small test equipment manufacturer or scientific staff, you should do well if you go to the various agencies spending money on research projects.

One small firm with a top notch staff right now is doing a \$100,000 annual business with Bunker, yet started with assets of \$50,000. That's an extreme example, but still it gives an idea of what can result if your staff has special knowledge of some phase of interests in research in the research and development process.

► Chances for Business—The big group in aviation interests spending offers a good opportunity for many companies now doing little or no government work. On the new types of gear being called for, almost all potential makers start even in the race to get contracts. Only the original developer has an edge in tooling and experience in that piece of equipment. And after the holder of the development contract hasn't the capacity necessary for volume production.

That's one reason an avionics firm ought to go after government business now. Here's another: you need a hedge against full-scale mobilization that would lay off materials for your civilian

production. To get listed with the Munitions Board and scheduled for mobilization work, you have to have the recommendation of one of the procurement agencies. So it's best to start right now, trying to get government contracts.

You'll get a sympathetic reception. Procuring agencies have been working hard to get more firms to bid on avionics contracts. That's only part of the buyers' problem. What they want more than anything else is a reliable product—one that can be counted on never to fail in the air when the pilot needs it.

If you can make a reliable product, the procurement agencies want to hear from you. They may stop working on other firms to bid if your product proves more trustworthy.

► Competition—Wantad-Yan can get a reasonably position sometimes in competing with large firms. If your product is a standard type article, it accepted after testing, you are put on the "Qualified products list" for that item. Then it need not be sold alone automatically from the Air Force and Navy directly, and from prime contractors doing work for them.

On many items, including types of relays, transistors and tubes, there is only one single supplier on the "Qualified products list." But the procurement agencies hope for more competition. Many items that are nearly monopolies as far as military avionics procurement is concerned could easily be made to compete if the market were that large. All they have to do is make a change in specifications and get it approved.

Because of greater secrecy, plus secrecy, most avionics business is on a restricted, negotiated bid basis, instead of being publicly advertised. Thus, many potential competitors are automatically excluded from the market if they have not taken the initiative in working out the procurement agencies and their demands.

► Capital Available—Some firms fail to get into military avionics business because they think they do not have enough working capital to take on a real military production schedule in addition to their commercial work. But under the Assignment of Claims Act, you can get a loan for government work.

This act makes it possible for you to obtain a loan from any qualified financial institution by assigning your "set-aside" payments by the government to the lender. Also, the Reconstruction Finance Corp. may help small firms. **► Civil Bazaar**—Biggest avionics buyers are Air Force, Bunker and Biddle. That is the present set-up. Over the long term, the Civil Aviation Administration, the airlines, and other

Shooting a bird...

IN THE AIR AGE

THERE is "shooting a bird" at the U.S. Naval Air Missile Test Center, Point Mugu, California.

The "shot" is the launching of a missile, while the "bird," in this particular case, is the Fairchild CTV-N-1a guided missile.

In a matter of seconds the missile is hurled high into the atmosphere with a deafening roar, propelled by its reaction-type motor and auxiliary booster. Separation of the booster occurs as the missile speeds higher and higher into space, stabilized and controlled by the "guidance" of its electronic guidance system.

Soon the bounding green and ground observers no longer see the missile ... but its path is being carefully plotted as it holds toward its target, now under its own hunting control.

The "shooting a bird" is but one phase of the Lark project. It is an operation requiring split-second timing and perfect coordination. It is the result of teamwork between the Bureau of Aeronautics, Navy Testers, the Naval Research Laboratory and Fairchild engineers and represents a combination of the best in aerodynamic design, electronic controls and precision manufacturing.

Here is another example of a Fairchild first and of "shooting a bird" ... in the Air Age.



ENGINE AND AIRPLANE CORPORATION
FAIRCHILD
Guided Missiles Division
FAIRCHILD AIRS, LONG ISLAND, N. Y.

WHY DO SO MANY PEOPLE SAY...

SEND IT TO
Airwork

Airwork

More and more, airline officials and owners of executive aircraft are saying, "Send it to Airwork." Here's why:

Month after month, the newly overhauled Pratt and Whitney engines and accessories from our production lines are setting records for dependability, extra performance, more economical operation and longer life between overhauls... You will profit by saying, "Send it to Airwork."

Airwork Corporation also distributes the following aviation products: Bendix, RG, Cherrington, Cessna, Custer, Jack & Smith, Packard Cable, Paco, Pratt & Whitney, Sauer Parts, Thermo-Products, Teleflex, and U.S. Filter.

ONE OF THE FOUR



PRATT & WHITNEY DISTRIBUTORS

Airwork
CORPORATION
MILLVILLE, NEW JERSEY

Tips on Selling

• Take the initiative in getting your first listed with the proper agencies. Research, much of which is research and development is necessary.

• Get your firm security-checked immediately by nearest Air Force or Navy inspector.

• On research and development work, find a representative so the office you are visiting believes from. Research and development isn't a commodity, such job is likely to be unique. Electronics technical offices have to be careful in screening potential contractors. In seeking research and development work you must even list educational and small services of your experience and resources.

• If you are a subcontractor on missile equipment be sure your name is on the list. It is a valuable reference list of parts you normally buy. When more "spares" are needed in a hurry, procurement offices sometimes cannot find out who made the components of the original procurement.

• Be sure your product is reliable. That's more important than cost. Aviation equipment must be more dependable than any other type of item bought.

• Get on the "certified products" list. This will establish a long-lived market for them in time.

• Try for research work if you have a small but good engineering unit. Research jobs that need sub-contractors can take advantage of 100 to 1000 man. You will maintain high speed but be small enough to have low drag, value countermeasures equipment.

Business markets will grow to greater stature. But right now, Air Force and Navy are the great customers.

The Air Force central procurement act up gives the after a big break. Through contact with the Air Materiel Command at Dayton, you can get detailed item listing of classes of avionic material bought. Regional offices take it from there to get a good look at the business in its home area, for which you may want to consider applying listed as a potential seller.

Some more important avionic classes are:

- Class 16—Communication Equipment, this includes all radio and voice transmission equipment, components, accessories and parts.
- Class 03—Aircraft and Engine Accu-

Recommended Starters— Because They Are Made for the Job by ECLIPSE-PIONEER

The first order for an Eclipse Aviator Engine Starter was placed in 1916. Ever since, operators throughout the world have continued to recommend Eclipse Starters for use on all types and sizes of aircraft power plants. Following is a list of some of the modern starters engines for which Eclipse Starters have been designed to do the job.

RECIPROCATING ENGINES

Manufacturer	Model	Manufacturer	Model
Allison Division	V-1710	Pratt & Whitney Division	Twin Wasp (R-2800)
General Motors Corp.		United Aircraft Corp. (Continental)	Twin Wasp (R-2800)
Continental Motors Corp.	B-770 B-850 B-890 B-950 B-1020 B-1150	United Aircraft Corp.	Twin Wasp (R-2800)
		Deutsche Wulf (D-1900)	Deutsche Wulf (D-1900)
		General Electric Corp.	General Electric (G-1400)
		Wright Aircraft Engines Division	Wright R-1820 & R-2120
		Pedroff Division	
		Wright Aircraft Engines Division	W-4400
		Pedroff Division & Eclipse Corp.	W-5000 & W-7000
Lycoming Division	040-240		
Waco Mfg. Co.		Wright Aeronautical Corp.	Cyclone 7 & 10 (R-1800)
			Series C (R-1800)
		Pratt & Whitney Division	Cyclone 9 & 12 (R-2800)
		United Aircraft Corp.	Series C (R-2800)
		Wasp (R-1800)	Cyclone 14 (R-3300)
		Wasp (R-2100)	Series C1 (R-3300)
		Wasp (R-2300)	Series C2 (R-3300)
		Wasp (R-2800)	Series C3 (R-3300)
			Cyclone

AIRCRAFT GAS TURBINES

Manufacturer	Model Number	Manufacturer	Model Number
Allison Division		Pratt & Whitney	
General Motors Corp.	J34-A-10 J34-A-11 J34-A-12 J34-A-13 J34-A-17 J34-A-20 J34-A-25 J34-A-30 J34-A-35	Wasp (R-1800)	J47-A-4 J47-A-6 J47-A-8
		Wasp (R-2100)	J47-A-10
		Wasp (R-2300)	J47-A-12
		Wasp (R-2800)	J47-A-14
		Wasp (R-3300)	J47-A-16
		Wasp (R-3300)	J47-A-18
		Wasp (R-3300)	J47-A-20
		Wasp (R-3300)	J47-A-22
		Wasp (R-3300)	J47-A-24
		Wasp (R-3300)	J47-A-26
		Wasp (R-3300)	J47-A-28
		Wasp (R-3300)	J47-A-30
		Wasp (R-3300)	J47-A-32
		Wasp (R-3300)	J47-A-34
		Wasp (R-3300)	J47-A-36
		Wasp (R-3300)	J47-A-38
		Wasp (R-3300)	J47-A-40
		Wasp (R-3300)	J47-A-42
		Wasp (R-3300)	J47-A-44
		Wasp (R-3300)	J47-A-46
		Wasp (R-3300)	J47-A-48
		Wasp (R-3300)	J47-A-50
		Wasp (R-3300)	J47-A-52
		Wasp (R-3300)	J47-A-54
		Wasp (R-3300)	J47-A-56
		Wasp (R-3300)	J47-A-58
		Wasp (R-3300)	J47-A-60
		Wasp (R-3300)	J47-A-62
		Wasp (R-3300)	J47-A-64
		Wasp (R-3300)	J47-A-66
		Wasp (R-3300)	J47-A-68
		Wasp (R-3300)	J47-A-70
		Wasp (R-3300)	J47-A-72
		Wasp (R-3300)	J47-A-74
		Wasp (R-3300)	J47-A-76
		Wasp (R-3300)	J47-A-78
		Wasp (R-3300)	J47-A-80
		Wasp (R-3300)	J47-A-82
		Wasp (R-3300)	J47-A-84
		Wasp (R-3300)	J47-A-86
		Wasp (R-3300)	J47-A-88
		Wasp (R-3300)	J47-A-90
		Wasp (R-3300)	J47-A-92
		Wasp (R-3300)	J47-A-94
		Wasp (R-3300)	J47-A-96
		Wasp (R-3300)	J47-A-98
		Wasp (R-3300)	J47-A-100
		Wasp (R-3300)	J47-A-102
		Wasp (R-3300)	J47-A-104
		Wasp (R-3300)	J47-A-106
		Wasp (R-3300)	J47-A-108
		Wasp (R-3300)	J47-A-110
		Wasp (R-3300)	J47-A-112
		Wasp (R-3300)	J47-A-114
		Wasp (R-3300)	J47-A-116
		Wasp (R-3300)	J47-A-118
		Wasp (R-3300)	J47-A-120
		Wasp (R-3300)	J47-A-122
		Wasp (R-3300)	J47-A-124
		Wasp (R-3300)	J47-A-126
		Wasp (R-3300)	J47-A-128
		Wasp (R-3300)	J47-A-130
		Wasp (R-3300)	J47-A-132
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		Wasp (R-3300)	J47-A-146
		Wasp (R-3300)	J47-A-148
		Wasp (R-3300)	J47-A-150
		Wasp (R-3300)	J47-A-152
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		Wasp (R-3300)	J47-A-200
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		Wasp (R-3300)	J47-A-204
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		Wasp (R-3300)	J47-A-210
		Wasp (R-3300)	J47-A-212
		Wasp (R-3300)	J47-A-214
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		Wasp (R-3300)	J47-A-228
		Wasp (R-3300)	J47-A-230
		Wasp (R-3300)	J47-A-232
		Wasp (R-3300)	J47-A-234
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		Wasp (R-3300)	J47-A-238
		Wasp (R-3300)	J47-A-240
		Wasp (R-3300)	J47-A-242
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		Wasp (R-3300)	J47-A-250
		Wasp (R-3300)	J47-A-252
		Wasp (R-3300)	J47-A-254
		Wasp (R-3300)	J47-A-256
		Wasp (R-3300)	J47-A-258
		Wasp (R-3300)	J47-A-260
		Wasp (R-3300)	J47-A-262
		Wasp (R-3300)	J47-A-264
		Wasp (R-3300)	J47-A-266
		Wasp (R-3300)	J47-A-268
		Wasp (R-3300)	J47-A-270
		Wasp (R-3300)	J47-A-272
		Wasp (R-3300)	J47-A-274
		Wasp (R-3300)	J47-A-276
		Wasp (R-3300)	J47-A-278
		Wasp (R-3300)	J47-A-280
		Wasp (R-3300)	J47-A-282
		Wasp (R-3300)	J47-A-284
		Wasp (R-3300)	J47-A-286
		Wasp (R-3300)	J47-A-288
		Wasp (R-3300)	J47-A-290
		Wasp (R-3300)	J47-A-292
		Wasp (R-3300)	J47-A-294
		Wasp (R-3300)	J47-A-296
		Wasp (R-3300)	J47-A-298
		Wasp (R-3300)	J47-A-300
		Wasp (R-3300)	J47-A-302
		Wasp (R-3300)	J47-A-304
		Wasp (R-3300)	J47-A-306
		Wasp (R-3300)	J47-A-308
		Wasp (R-3300)	J47-A-310
		Wasp (R-3300)	J47-A-312
		Wasp (R-3300)	J47-A-314
		Wasp (R-3300)	J47-A-316
		Wasp (R-3300)	J47-A-318
		Wasp (R-3300)	J47-A-320
		Wasp (R-3300)	J47-A-322
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		Wasp (R-3300)	J47-A-332
		Wasp (R-3300)	J47-A-334
		Wasp (R-3300)	J47-A-336
		Wasp (R-3300)	J47-A-338
		Wasp (R-3300)	J47-A-340
		Wasp (R-3300)	J47-A-342
		Wasp (R-3300)	J47-A-344
		Wasp (R-3300)	J47-A-346
		Wasp (R-3300)	J47-A-348
		Wasp (R-3300)	J47-A-350
		Wasp (R-3300)	J47-A-352
		Wasp (R-3300)	J47-A-354
		Wasp (R-3300)	J47-A-356
		Wasp (R-3300)	J47-A-358
		Wasp (R-3300)	J47-A-360
		Wasp (R-3300)	J47-A-362
		Wasp (R-3300)	J47-A-364
		Wasp (R-3300)	J47-A-366
		Wasp (R-3300)	J47-A-368
		Wasp (R-3300)	J47-A-370
		Wasp (R-3300)	J47-A-372
		Wasp (R-3300)	J47-A-374
		Wasp (R-3300)	J47-A-376
		Wasp (R-3300)	J47-A-378
		Wasp (R-3300)	J47-A-380
		Wasp (R-3300)	J47-A-382
		Wasp (R-3300)	J47-A-384
		Wasp (R-3300)	J47-A-386
		Wasp (R-3300)	J47-A-388
		Wasp (R-3300)	J47-A-390
		Wasp (R-3300)	J47-A-392
		Wasp (R-3300)	J47-A-394
		Wasp (R-3300)	J47-A-396
		Wasp (R-3300)	J47-A-398
		Wasp (R-3300)	J47-A-400
		Wasp (R-3300)	J47-A-402
		Wasp (R-3300)	J47-A-404
		Wasp (R-3300)	J47-A-406
		Wasp (R-3300)	J47-A-408
		Wasp (R-3300)	J47-A-410
		Wasp (R-3300)	J47-A-412
		Wasp (R-3300)	J47-A-414
		Wasp (R-3300)	J47-A-416
		Wasp (R-3300)	J47-A-418
		Wasp (R-3300)	J47-A-420
		Wasp (R-3300)	J47-A-422
		Wasp (R-3300)	J47-A-424
		Wasp (R-3300)	J47-A-426
		Wasp (R-3300)	J47-A-428
		Wasp (R-3300)	J47-A-430
		Wasp (R-3300)	J47-A-432
		Wasp (R-3300)	J47-A-434
		Wasp (R-3300)	J47-A-436
		Wasp (R-3300)	J47-A-438
		Wasp (R-3300)	J47-A-440
		Wasp (R-3300)	J47-A-442
		Wasp (R-3300)	J47-A-444
		Wasp (R-3300)	J47-A-446
		Wasp (R-3300)	J47-A-448
		Wasp (R-3300)	J47-A-450
		Wasp (R-3300)	J47-A-452
		Wasp (R-3300)	J47-A-454
		Wasp (R-3300)	J47-A-456
		Wasp (R-3300)	J47-A-458
		Wasp (R-3300)	J47-A-460
		Wasp (R-3300)	J47-A-462
		Wasp (R-3300)	J47-A-464
		Wasp (R-3300)	J47-A-466
		Wasp (R-3300)	J47-A-468
		Wasp (R-3300)	J47-A-470
		Wasp (R-3300)	J47-A-472
		Wasp (R-3300)	J47-A-474
		Wasp (R-3300)	J47-A-476
		Wasp (R-3300)	J47-A-478
		Wasp (R-3300)	J47-A-480
		Wasp (R-3300)	J47-A-482
		Wasp (R-3300)	J47-A-484
		Wasp (R-3300)	J47-A-486
		Wasp (R-3300)	J47-A-488
		Wasp (R-3300)	J47-A-490
		Wasp (R-3300)	J47-A-492
		Wasp (R-3300)	J47-A-494
		Wasp (R-3300)	J47-A-496
		Wasp (R-3300)	J



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society and antiaircraft parts.

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- Convair 110—Aircraft Armament.
- Convair 63—Aircraft Engines and Mass Production parts.

Better sources are included in an annex type of equipment classification, you will find a list to visit any one of the Air Force Procurement Field Offices. You can see all the class breakdown. Then you won't want my name you can't find.

Note that the Signal Corps buys a sizable chunk of warheads for Air Force, through its Philadelphia procurement office.

If you have a staff with engineering and scientific experience, you may gift your company to the Air Force as a testing subcontractor. Research and development contracts are let to firms on the list. To get on the list, yes, you should send a memo to Wright-Patterson. He will forward the project people to the Subcontractor of the Engineering Division and the buyer of warheads to the Procurement Division.

► Navy Buying Bombs—The Navy is set up on the bureau system, for the sake of fighting efficiency. The main warhead procurement is a little more difficult than it is through the Air Force. But all major buying offices are located in the Navy Building in Washington.

Blakely, production director, electron jet service, buys airframe warheads. In the longest, Navy avionics procurements always agency. A large part of Blakely procurement is in serial orders for reuse, reuse of equipment popular to one

supplier. On the other hand, lots most of its prime contracts for large and complex units.

Barber Electronics Division does research and development planning, sets requirements, does engineering design, and lets engineering and development contracts. Research contract scheduling, development to production stage, works like most research planning.

After evaluation and qualification of a piece of equipment, Electronics Division awards a small quantity production contract to the developer. This item is now produced on a design for later large quantity production. Then, as quantity, is let an integrated warhead, had by the Blakely Production Division. Company submitting the best bid gets the job.

► CAA Buying—Air CAA avionics procurement contracts are by public invitation to bid. CAA techniques draw up specifications, and the procurement office (Washington) sends bid notifications and advertisements.

Right now, CAA procurement is listed at about \$11 million, so the bidding list is substantial. But CAA

boycott says they should welcome the new, and other firms not on their list. Only reservation is that Baldwin must be prepared to meet delivery date specified. Some sensible companies have occasionally contracted to deliver on a date they don't see they can make. That's how CAA programs all schedule.

► The big future—Audi from the earliest days involved in the antiaircraft navigation and radio control program of the Air Navigation Development Board. The ANDB coordinates research and development work and, in making ultimate flight, a results-oriented research is used as much as possible and accurate.

The present military contract will speed up ANDB's \$1 billion plus. So the day when there will be huge funds allocated for warheads is rapidly drawing closer. The success ANDB's development work and of making ultimate flight, a results-oriented research is used as much as possible and accurate.

The present military contract will speed up ANDB's \$1 billion plus. So the

CONTRACTS VALUE OF CONTRACTS RECEIVED	
1959	\$1,000,000
1960	\$1,000,000
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2099	\$1,000,000
20100	\$1,000,000

ON SCHEDULE—This chart of antiaircraft weapon development was put out two years ago. Fast that work is easily on schedule has a meaning for hollows don't present a delivery date you can't meet.

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ANDB does its work under policy guidance of the Research and Develop-

ment Board of the Defense Department, as well as the National Board of CAA and aviation agencies. An director was established which would assist research facilities would be assigned ANDS would use its powers to assign projects to that cause immediately without costs, often stopping long-range projects to get immediate says finished and certified. So it's well to know what types of equipment will be needed.

► **Transitions** Program-Here are the major new equipment projects that ANDS is working on for CAA and the military. Study of impact insulation/absorp-

tion-completed. Specifications for developmental models of the equipment are being written. This project will later be in with another project under study-light-path planning equipment.

Development of R-Theta transponder and associated ground components is being speeded up. Twenty airborne units and one complete ground station are scheduled for delivery next spring for evaluation.

Development of swept-surface de-icing equipment (ASDII)—Transonic and Avionics Center will evaluate developmental model and award Contract for development of engineer-

Major Buyers Of Avionics

Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio. Procure airborne and ground electronics and electro equipment.

Wilson Laboratories, Red Bank, New Jersey—Research and development equipment and contracts for ground institutions.

Bureau of Ordnance, Navy Department, Washington—Airborne equipment and research and development contracts.

Bureau of Ships, Navy Department, Washington—Complete units and major subassemblies, shipboard and ground radar and communications.

Bureau of Ordnance, Navy Department, Washington—Aircraft fire control radar and communications.

Navy Electronics Supply Office, Great Lakes, Ill.—Spares parts and smaller components for B-52B equipment.

Milav Aviation Supply Office, Philadelphia, Pa.—Spares parts and components for B-52B equipment.

Airway Signal Corp. Procurement Agency, Philadelphia, Pa.—Procurement of some ground equipment and research and development for Air Force.

Procurement Branch, Civil Aerobatics Administration, Washington—All civil aviation procurement, also procure and supply some for Air Force and Navy.

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Just one medium airplane can capture as much heat generating capacity—for cabin heat, instruments, ports, wings, and suspension anti-icing, and a dozen other things—as put out by the huge 280,000 Btu per hour furnace shown at the right.

Getting heaters down in size for aircraft is quite a story, but that's only part of the problem. Today's aircraft heaters must handle air at sea level or very altitude; must be easy to maintain and replace; must function safely and dependably under almost any condition of temperature.

Heaters have learned to fly with fascinating ingenuity, and can range in size from the compact "Janitrol" system. The furnace which does its principal job of combustion, for instance, was Janitrol-developed. So was the radiant tube-within-a-tube that packs more heat into less space. And so, too, is the new era vapor-charged heater that cuts size and weight plus fire down still further.

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GUIDED MISSILES

A Growing, But Exacting Market

Guided missile construction demands new and delicate skills. If your plant has them you are needed.

By David A. Anderson

Guided missiles have turned out to be a different breed of cat than the airplane-much in the sense of the aircraft manufacturers who are in the business of building the things.

Some of the认识到的 can be reduced by subcontracting the job to manufacturers who have the specialized skills needed to turn out missiles. But one slowdown has been that many prospective subcontractors don't know that they have the tools or skills to do the job.

And the reason for this is a necessary understanding of the job.

That's where **INTERTECH** is. It is going to make it difficult for subcontractors and prime contractors to get anything accomplished in their first few meetings. The prime contractor can't tell much about the missile until the subcontractor's personnel are claimed to receive such information.

The subcontractor, quite frankly, may not want to go to the trouble of getting cleared until he can see what he is going to be working on, and judge whether the game will be worth the candle.

Now, we're about ready to build some missiles.

But what kind? How big? How heavy? What warheads?

To answer these questions, it is necessary to explain a little about missiles in general.

Classical—It would seem that in the United States, interest centers about three general classes of missiles:

■ **Ballistic**—Typified by the German V-2.

■ **Ambulatory**—Typified by Boeing's *Capsa*, or Ordnance's *Nike*.

■ **Aero-din**—To be used by fighters and bombers instead of the more conventional machine gun or missile.

These categories also serve to divide the missiles into two groups: **Ballistic** and **ambulatory**; **ambulatory**, **missiles**, **missiles**.

Ballistic—These are the great and quiet ones. Missiles can be transported by flying, railroad, or road. They can have solid engines, steam engines, turbine engines, or an engine.

They can also fly at supersonic or subsonic speeds, in the atmosphere, outside of it, or in both places during their brief lives.

In short, they are a different breed of cat.

It isn't possible to talk much about specific types of missiles. But suppose that a couple of representative varieties of missiles are explained in some detail, as examples of what might be.

■ **Two-loc** **Boeing**—Boeing's missiles are currently categorized as one of two types:

■ **Plotter**—short, probably subsonic, powered by a turbine, flying within the stratosphere, proceeding at new speeds.

■ **Artillery**—probably supersonic, powered by rocket motors, flying through the atmosphere and outside of it, the atmosphere, proceeding at new speeds.

In the former category, the aircraft manufacturers are at least "They and their small subcontractors can handle the job very nicely."

That is a crying need in the aircraft-type missile, though.

■ **Steady**—An *Boeing*-style subcontractor receives a stack of blueprints. After his staff have studied them for several days, they find that they are to build a 30 ft-long, 5 ft diameter rocket-powered missile.

From its sharply pointed nose to its blunt tail, it is covered with gleaming stainless steel skin. In this (as in aircrafts or aircrafts) are shortcomings. There are smaller tail surfaces. The dark skin has two large fins for roll and yaw control, a framework for the nose cone, three fins for the warhead.

The tail of materials made aluminum alloy, stainless steel, copper, platinum, carbon, cold-rolled steel, pure aluminum, wood, lead.

The 60 ft long range calls for it to have within a circumference of 6 in. Tail surfaces are to be aligned with the centerline of the missile within 0.1 deg. Thrust has through the center must match the missile warhead equally well. The nose skin must be pointed—and further it can't be rounded. All joints must be tight joints with not more than a 1/16 in gap.

To the manufacturer, who may have been a flying fox, equivalent, that all sounds as simple as a child's play.

But it is all necessary, to bring the tail drop of performance out of the missile.

Tail surface alignment, for instance. When the missile plunges towards its



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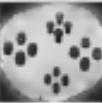
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target as the number of the earth, it is a "driving" along at supersonic speeds. It is not being controlled towards your target, because its fuel tank (here the power source for auxiliary drives) was consumed long before. It falls freely, kept on its calculated course only by the weathercock action of the tail fins. They have to be set accurately, to avoid banking in on errors due to wind/turbulence forces caused by manouvering. And they have to be considerably accurate from muscle to muscle, to keep the dispersion pattern of many warheads small.

• **Class Note**—Rotolocite has not been used to keep the aircraft steady—nearly always by using a gyroscopic gyroscope. By eliminating the left and right of conventional aircraft, this, and by reducing to one tap point, the drag of the aircraft has been kept to a minimum for the rollabout here.

Besides the obvious reason that it is always good to have low drag, there is another good and important reason for aerodynamics.

Mobile design is basically curious. Two—we know it little, even yet. Aero dynamics have to work in a greatly altered field where basic theory is in disarray, and practical experience is largely what ever the expert designs. So, to be safe, the aerodynamics is radical. It's equally radical, though, because it is clear that if the missile does not meet its performance requirements, somebody is going to come right back to him. It's a form of insurance, this external consideration.

Consequently, of course, means that two rings, made by different manufacturers and riveted, will not leave a dog-producing boop or ledge. So far, smoothness, as well as interchangeability, close tolerances in concentricity are demanded.

• **Subcentrifugal** Mean—it thus looks like, went protective measures for subcentrifugal sections of the aero-assembly, instrument or control components, the underbody, the tail fin or tail cone.

There's more to the missile than meets the eye. Underneath the skin of the control incorporated, there are precision gears, for control, integrating accelerometers, for power regulation. There might be a radio beacon for tracking, or command receiver for ground or foliage. This is the backbone of the instrument manufacturers and the specialty supplier there.

Pushed back, in the missile body there are tanks for fuel. They may have to be standard stuff, pure aluminum, E-Metal. But basically, these tanks are pressure vessels and they can be made by castings to the chemical and fluids withstand as they can be made by sheet metal shapes.

In the tail, the motor is made of

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AV-11 — Electric-Magnetic, 3-Way Valve. 1/2" Valve Size. Operating Pressure to 3,000 p.s.i. For Air, Oil and other Fluids. Both High and Low Temperature.



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vacuum ports. The head, which injects fuel and oxidant into the combustion chamber, is a precision polished stainless steel. In fact, most of the motor parts call for extrusions still in aircraft tool work, powered only by frictional induction. Here, then, is another possible set of subassemblys—precision machine shops and tooling.

Throughout the structure, stainless steel has to be added. The walls have to be ground, to reduce drag, but have to maintain full strength, regardless. Many of these walls must be pressure tight up to two atmospheres. And especially with stainless steel welding, particularly on this sheet stock, a not inaccuracy is that costly.

In the sheet metal work, ingenuity calls an accuracy. Sheet is cut up to 8 ft. width and in 4 in. thickness will be handled.

► **Auto-Safety**: Module-for, only one class of aircraft has been covered yet. Now is the time to say something about a hypothetical announcement with this.

Concern is that this one will be powered by a swept engine, that it will have wings as well as flat surfaces that it will be about 20 ft. long, 2 ft. in diameter.

Biggest difference between this class and the high-speed monoplane is that the swept engine requires no pitch length in operation to the region of the monoplane.

Popularity, and quite reasonable, the concept has been called the "Flying Slope". It isn't nearly as simple as all that.

The low-flow pressure sounds implemented in this in the final result, represented by the forward part of the nose, lined with fuel, housed in a combustion chamber and packed out the exhaust nozzle.

Exhaust velocities are as the order of a few hundred feet per second, not velocities, several thousand.

Heat release for a straight flight is about 60 million Btu per hr per lb., one tenth of that is high for an ordinary aircraft.

The air that goes through the nozzle must be handled just as carefully in the air which passes over the outside. The airfoils, production and manufacturing problems.

Now, all the lower sections won't be glass panels, with the possible exception of the combustion chamber. Previous models about fuselage, tolerances and concentricity held even more stringently.

An example of a possible test need for the external surface, can subcontractors recently suggested that the way to build a particular swept wing is to make it with an over-thick skin, removable and then set it between centers on a

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Type 1100 (ACN 5512) Low Wall Thermocouple. These instruments are designed for aircraft applications where space is limited. The probe is a small, thin-walled tube which is inserted into the aircraft structure. The probe is held in place by a retaining ring and is connected to the control unit by a flexible cable.



Type 1100 (ACN 5514) Rectifier. This instrument is used to convert the alternating current from the aircraft's electrical system into a direct current that can be used by the aircraft's instruments. The rectifier is connected to the aircraft's electrical system and to the aircraft's instruments.

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South Wind Production Facilities are specifically adapted to the specialized techniques of aircraft parts production. Only government certified welders, for example, work on South Wind aircraft heaters. This holds are welding of the tube bundle on aircraft heat exchangers requires top-notch precision and skill to withstand the great thermal stress of exhaust-gas flow in high-altitude operations.



United States Air Force Standards are met by every South Wind aircraft heater, regardless of whether it is built for military, commercial or civilian use. Third government inspection is satisfied before any South Wind heater leaves the plant for aircraft manufacturers. That's why manufacturers of the nation's leading aircraft depend on South Wind heating equipment for utmost safety, maximum efficiency and minimum maintenance.

South Wind stands ready to help you solve your aircraft heating problems. From 25,000 to 400,000 BTUs per hour, South Wind Heat Exchangers or Condenser-type Heaters are adaptable to any type aircraft. For specific model information or expert assistance on development or production, write now to the South Wind Division, Stewart-Warren Corporation, Indianapolis 7, Indiana.

South Wind
AIRCRAFT HEATING AND
THERMAL ANTI-ICING EQUIPMENT

gender and gland to external contour. Such a procedure, while expensive for one model, would be reasonable for more, for then it was considered necessary to match the requirements of flow conditions. It eliminates part inter-changeability, but magazines were willing to compromise in that case. They had already decided to use selective assembly of parts for their model, any way.

► **Epilogue.**—That is as much detail as is possible, in the beginning of the story on building missiles.

Each chisel will have its special profile, and this one was just about as unusual. In contrast to this, the machinist will have to be a workaholic to be able to fit everything into a ten diameter body. And surface has been said about the difficulties of machining cubes such as the German did (not something like 50 percent spalled) or making reddit to operate inside the hot exhaust blast of the V-2. Or about one of the myriad tasks confronting the engineers of large missiles, grinding, sawing, squaring or tract blades in their square cross-sections, hexagonal and pyramidal, that they select.

The missile program will call for grinding out and coarsening abra-sion in a scale never before seen.

Missile Market Starting to Grow

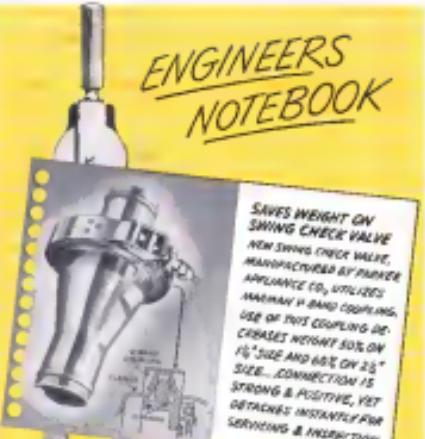
The extent to which guided missile development and production has to be cultivated was sharply outlined by Major Gen. Carl Brandt, Air Force director of requirements, in testimony on his department's appropriation.

"Guided missiles," said the general, "differ markedly from other missile weapons, in many ways. Guided missiles are really living. They have no graded missile organizational levels. We are just beginning to train the instructors who must train the men to run these organizations."

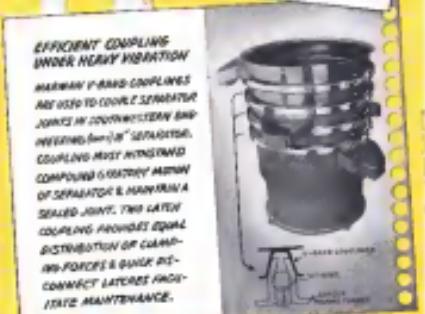
"It is apparent that . . . missiles . . . should be produced as soon as research and development supplies a missile that appears reliable."

Although Air Force engineers with graded missiles, as Gen. Brandt pointed out, has been limited, testimony on the appropriation bill showed that there are some missiles available in the missile parts parts market. Depending on the complexity of the missile, the spare parts requirements will be from 10 to 20 percent of the original cost of the missile. Some parts even for the electromechanical parts of the missile will run higher than 20 percent of the original cost.

ENGINEERS NOTEBOOK



SAVES WEIGHT ON SWING CHECK VALVE
NEW SWING CHECK VALVE,
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1/2" SIZE AND 66% ON 2 1/2"
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Maximum take-off power...

Globemaster pilots

get it safely with the aid of

LEAR-ROMECA water injection pumps

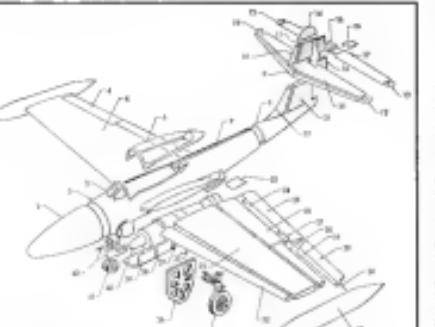
When Globemaster pilots open their throttles for takeoff, the mighty engines of this mammoth plane develop an extra surge of power and sustain their maximum horsepower rating, thanks to the dependable aid of LEAR-ROMECA water injection pumps. Although this sturdy pump handles equipment in all Grumman, T-33, F-86, F-100 and F-105 fighters, as well as in the Douglas Globemaster C-124, weight less than 12 pounds with motor, it is rated at 400 gallons of antifreeze fluid at 3000 rpm. A double-bore-boreless relief valve maintains adjustment under extremes of atmosphere or supercharge pressure, and is adjustable in any desired discharge pressure. Lubrication is provided by the liquid passing through the pump.

To prevent corrosion, all stainless steel is coated with non-conducting materials. Full engineering specifications and test reports on the ED-7000 water injection pump (listed above) are available upon request. Bring your pump problems to LEAR-ROMECA, specialists in the design and manufacture of precision aircraft and industrial devices for over twenty years.



A DIVISION OF LEAR INCORPORATED AT BETHLEHEM, PENNSYLVANIA. LEAR-ROMECA makes aircraft distributed de-icing systems, and aircraft, gyro instruments, aircraft motors, aircraft radio, and aircraft attitude indicators.

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3. HOSE ASSEMBLY - FORWARD LANDING GEAR	15. HOSE ASSEMBLY - FORWARD LANDING GEAR
4. HOSE ASSEMBLY - FORWARD LANDING GEAR	16. HOSE ASSEMBLY - FORWARD LANDING GEAR
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28. HOSE ASSEMBLY - FORWARD LANDING GEAR	40. HOSE ASSEMBLY - FORWARD LANDING GEAR

F-104 SCORPION breakdown shows major assemblies, many of which are subcontracted.

How to Get Subcontracts

The small firm will get about a \$2.7-billion share of fiscal 1951 procurement, if it is qualified.

There is going to be plenty of room for the small business and subcontractor at the \$7.5 billion fiscal 1951 aircraft budget table. But he probably won't be invited unless he is willing to handle the risk too.

The prime contractor will not be kicking the door in, but, in many cases, they will be raising interference for the smaller firms.

Some, such as Pratt & Whitney Aircraft Division of United Aircraft Corp., will throw both the door and a rock

through with subcontractors. That has been P&W's policy since Frederick B. Rentschler established the firm in 1932. Others, such as Wright Aeronautical Corp., will share a much smaller portion.

But a good guess would be that at least 51.7 billion of the fiscal '51 aircraft procurement budget will be spent with subcontractors. That does not include the money which will pay for raw materials and for off-the-shelf supplies.

► **Who'll Be There**—Who will be invited to the table? For the most part, the men who will be. But he will notice that the list of names on some prime contractor's sheet of subcontractor's paper might be short. And the size isn't the cause. Some subcontractors are handled best by ships of 20 men. Some subcontractors regard plants employing thousands.

The best assurance of an aviation procurement subfactory design with a prime contractor. If there has been no previous business relations between the parties, the contractor will most likely be interested in how the little man stands with signed to.

► **Process**—Can he handle an order, or will the nature of getting the contract require a different kind of vendor?

► **Equipment**—Does he have the necessary tools and equipment to do the job on schedule, or will he have to start arranging around the machinery when the order comes in?

► **Know-How**—Is he familiar with tight section tolerances, special materials, special process-approaches, welding techniques, and general procedures of the aircraft field?

► **Location**—Is his plant close enough to the prime contractor to permit fast to and from travel of engineers and inspectors for close liaison? Close location will also reduce vulnerability to transportation. In any event, will one of the major lower transportation costs?

► **Reliability**—Does the subcontractor's delivery, price, quality stand up against perceived performance?

► **How High-Hop Log**—Is a subcontractor's service? Could it be a power package for a Lockheed Constellation? Or the jet section of a C-130 jet pack for the B-52? Or doors for the Navy UF? Or parts for GE's J-47 jet engine? Or a gear cage for P&W's R-2800 engine?

It can be any of these and lots more. But Aircraft Corp. subcontractors have division power packages for Lockheed. Boeing is a Boeing subcontractor as the C-97. And a Convair subcontractor on the B-46. Among others, though, B.F.F. Co., on Long Island, N. Y., makes all the doors for Convair's Navy UF order. And so on down the line.

A subcontractor may be big or small. And the company that looks at it may also be big or small. But don't expect a shop employing 20 men in the one's garage to land a subcontract for B-52 wings.

► **First Meeting**—Does a subcontractor come to the attention of a prime manufacturer? Usually he will. He may write to the materials manager, production manager, manager of subcontractors, the sales manager, his company to compare to. A prime bid would be his address, opening correspondence to

Director, Subcontracts Department. It will be located in the proper office.

These are good points for the sub contractor to cover in the opening letter:

- Type of work he is prepared to accomplish to all.
- Type of work or products his own plant has made.
- Materials, tools, gages and fixtures required in the plant.
- Special skills possessed by his personnel.
- Capacity of plant for production of the subcontract, and room for later expansion.
- Previous experience with aviation.



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products and processes. This includes working in fine tolerances, and the machining and heat treatment of parts in financial position of the company.

Best returns for subcontract will usually be found close to home, but this is not the case in the West Coast area

more than elsewhere. 266W, 12th Street, with about 4600 hours in 34 states, including 129 in California, Springfield, on Long Island, N. Y., has as far as Detroit for subcontractor.

Republic Aviation has subcontractors in Chicago, Cleveland and Akron. Each

is subcontractor with more willing to look for work for the right man.

As the subcontractor's work picks up, and the best subcontractor's parts are loaded up, manufacturers will gradually become willing to look further afield, and probably be forced to take more of their other standards for subcontractors.

►Something to Offer—But right now, there is not much room for the man who thinks he would like to get some of the lucrative aviation business which he feels is starting around. Not him nothing concrete to offer the subcontractor. This probably also leaves not the small man whose only qualification is a desire to get into this work because his sources of raw materials are drying up.

If the business-seeking subcontractor's original letter of application sounds promising, the large manufacturer will follow up. Prospective rates are interesting from one visit the prospective subcontractor. Or he may be invited to send a representative to the big plant. A sales engineer is a good man for this job. He'll know what the company has produced and what it can produce. He ought to bring samples with him—or photographs. If samples are too big, copies of the plant floor plan, showing machinery locations, storage space, inspection areas, will help.

►Post an Order—If the prospective subcontractor passes these tests with flying colors, he may soon have his first order. Or, at least, he will have his foot in the door, with the prospect of being called in to bid on other contracts. The public Aviators will often pass along to other subcontractors the name of a subcontractor if contact the last who sounds promising.

About once a month, the sales engi-

Definitions

These manufacturers are going to be up about 12% in 1958, in the selection of new and new final designs. In addition, huge sums will go for ready-to-use and top plant items. Each company has its own idea as to what these groups comprise, but here is a pretty good outline:

►Subcontract: Work done according to the design and specifications of the prime contractor (that covers just if it's anything found out during a period of existence, but normally done at loose.)

►Vendor supplies, parts. Prod. sets designed by the seller, or produced to trade specifications.

►Supplies: Raw materials and process materials, such as sheet stock, bar stock, tubing



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They also provide a practical solution to the problem of insulating the thermal de-icing system of both jet and propeller-driven aircraft, as well as

cockpit and cabin air conditioning and heating systems—particularly for disturbance doors (where temperatures exceed the limit of non-metallic insulation materials), exhaust stacks and supports of heating units, etc.

Each performed shape consists of a Thermoflex asbestos felt, which is completely enclosed within an envelope—resistant to heat or moisture and metal foil to prevent the penetration of oil and other combustibles into the felt. Thermoflex wire facing provides a simple yet effective means of attachment and assures easy removal for inspection. All cutouts can be precisely located during fabrication to accommodate protruding components, thermal-susceptible leads, etc.

For more complete information, address Johns-Manville, Box 350, New York 16, N. Y.

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In an actual test Pioneer cargo parachutes, produced by Pioneer, dropped more than two tons of cargo successfully, safely in seven seconds... a remarkable example of the efficiency and performance of Pioneer 'chutes... designed and constructed to deliver the goods when and where needed. Pioneer Parachute Company, world leader in parachute production, has a special department devoted to the manufacture of cargo 'chutes for every purpose... from eight to 150-feet in diameter... for any type of cargo that can be dropped from an aircraft.



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year they were \$9,390,000, and 100 men have \$76,000.

• **War Products.** Principal products during the wartime period were complete power package units for the B-24 Liberators, the P-51's-2, P-51's-3, the P-47's-5, Command, canopies for the P-47's, Canopies, nose and boom doors for the Lockheed P-80 Lightning and canopy for the Lockheed Hudson bomber.

After the war, sales soared for power packages for the postwar Constellation, for C-47 transports, Convair Liners, Boeing B-50s and C-97s. Clark C-125s. Rohr also makes the complete exhaust system for Convair's B-36.

Since 1945, new orders have been received for both power package installations and exhaust systems and current orders have been increased. Rohr is buying new equipment for increased production and may have to expand its plant facilities again.

• **Tooling Survey.** Tooling survey is what makes Rohr click. When the company can't buy machinery, it builds what it needs. Examples are a home-made canister forming press used to make canisters for aircraft fuel tanks in the middle. And a home-made autoclave to convert that sheet metal to the thickness of a long exhaust tube.

Rohr hasn't any shortcuts to success for subcontractors. Jim Ben Bassett, chief of the tooling division, points out that prime subcontractors don't cash the difficult invoices. They keep the people fabricating in their own plants until accounting production, demands more factory space for assembly.

Also the subcontractor usually has to submit a competitive bid. This can be expensive. It cost Rohr \$12,000 to submit a survey on one job, then the company didn't get the order.

• **Rohr Subcontractors.** Rohr contains 600 members of 100 subcontractors who—about a dozen assemblies and up to 3000 different machined parts. These assemblies are parts needing metal forming, which the company avoids out when no facilities are local.

Because most of the outside work is machining, Rohr's outside production crew specialists in that line. It checks a prospective subcontractor to see if he can turn out work of minute quality. It also checks financial responsibility. When Rohr contracts out for parts it wants to know they'll be delivered.

In letting a subcontractor, Rohr looks over possible sources for equipment, required work load, and so on. Then the company informs them or forces them to bid on a job. All things being equal, the job will go to the lowest bidder.

Rohr maintains a record of subcontractors—those showing up meeting delivery promises, quality of work, and

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We specialize in the manufacture of pressurized shipping containers for gas turbine engines, reciprocating engines, missiles and delicate mechanisms. Our competent staff of trained engineers will assist in analyzing your problems.

PROTECT AGAINST



verage was reduced somewhat later in 1949 and early this year, but was in constant gear with the Korean situation. The exact amount of Boeing's post-shock-testing programs is not available, either in terms of dollar spent or in terms of aircraft weight, but B-47 work now subcontracted probably totals 37 percent.

The percentage on the B-50 and C-97 probably is lower, because these planes have been in existence longer and Boeing had to do most of the work at its Seattle and Renton plants to keep its work force together.

Total amount of work now subcontracted, passengers, is roughly comparable to what it was during World War II. The new orders Boeing has received since the subcontracting program's "advertising."

Except for the B-47 program, the additional work has been placed pretty rapidly with companies previously competing in Boeing projects. In virtually all cases, the supplier who received C-97 and B-50 subcontract several years ago is in a position to furnish the assemblies and parts needed for new work recently awarded.

Boeing's Wichita division, faced with new requirements, is expanding its subcontract program for the B-47. Partly responsible for that was a decision, reached after consultation with civic and military officials, to try to avoid any expansion program which would further tax the City of Wichita's already over-loaded water, sewer and power facilities. Most of the Wichita division's subcontractors that will be called on are outside of Wichita, although within the Midwest, as far as is practical and possible.

► Consolidated Vultee Aircraft Corp., San Diego, Calif., has about thirty sub-contractors and about 800 regular suppliers.

Of its present work, about 20 percent of the T-39 is subcontract out. That includes the landing gear and power plant. The figure on the B-56 is from 10 to 15 percent. The dollar value is not given.

Under potential business prospects, Consolidated's subcontract work will soon go up to about 30 percent in a matter of time and weight loads.

Geographic location is important, as some subcontractors may not make all highway deliveries. (Ryan had to knock off the bottom layer of plastic from the flat cars that carry the C-97 fuel storage sections so that they would clear.)

During preliminary contracts with prospective subcontractors, Convair does not let its contract partners know that it expects each contractor to improve their rate of efficiency. Convair also makes the

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prospective subcontractor's method of cost analysis and reporting.

- **Some Do It.** Also, Convair puts a general picture of the plant, and studies its labor costs, to take steps to determine what the cost and rate of efficiency might be for the prospective subcontractor and its ability to accelerate production.

Convair puts proposals on what the subcontractor thinks he can do. It acts up curves from this information and compares the comparative savings the prospective subcontractor expects to establish against existing standards. Standards are Convair's own experience or reasonable judgment.

To Convair the rate of improvement of the production efficiency is of prime importance.

Convair has a definite preference for companies with previous aviation experience, and for companies who have obtained that experience in these plants (for example, one subcontractor from World War II who went into making airplane home trailers kept alive his staff at decommissioning stations).

- **Schedule Not Set.** Convair hasn't firmed up its production schedules yet. It is proceeding cautiously in letting up subcontractors, hoping balance of expected schedules come through.

Convair believes the prime contractor should have the prerogative of placing

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AVIATION WEEK, September 25, 1958

ka business where it can best be served, hopes the government will let prime contractors live by their own subcontractors for the most part. The company says it takes us 6 weeks to get a new subcontractor in full swing.

- **Douglas Aircraft Co.** Santa Monica, Calif., has been in the popular position of performing its work with subcontractors at its subcontractors on its own projects, at various times since the war.

Douglas took part in the Boeing B-50 program, doing about 10 percent of the ship. And since the war it hasn't contributed out more than 75 to 80 percent of its overall production.

Douglas' subcontractors, it is down to about 300. That's far cry from the large volume of subcontractors the company built up on the laydown of World War II, when the volume of planes turned out was 50 times its present.

Douglas has a large capacity at its three plants with production capacity there three times as great as present production. Back in 1946, the company managed to add a trickle of business to its subcontractor to keep up business with them. Mostly Douglas sends out for special parts and sub-castings. Nearly all assembly work is done in the Douglas shops.

- **Honeywell.** Douglas' three plants—Santa Monica, Long Beach, and El Segundo—form a belt working among them, so the long haul employment levels uniform, enables Douglas to work at no subcontractor level.

The subcontractors are not far enough along for the company to determine how much work must be subcontracted. But it is a rule that subcontractors will get a bigger slice of the pie. Right now, though, Douglas is not looking for subcontractors.

The company still has a great number of these jobs from the last war. At that time the company actually set up in business a number of subcontractors.

Douglas has about 1000 regular parts suppliers.

- **Exterior Protection.** Project with previous experience taking several parts, not necessarily from Douglas, are preferred. They understand quality tolerance, production standards and related problems.

Location is important, but Douglas prefers subcontractors who are in the immediate area, as the prime contractor for close control of the project.

Douglas subcontracted hundreds of subcontractors during World War II. There it evaluated out 55 percent of the finished plane. A number of Douglas employees set themselves up as subcontractors, opening machine shops or small assembly plants.

Douglas is a subcontractor of a different sort through its Western Possess



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did you know AVIATION WEEK is this far out in front?

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MEMBER AAC AND AAF

MEASURED ON 17 INDEPENDENT READERSHIP PREFERENCE SURVEYS

Metals division, headed by Harry Woodhead, former president of Conver Western Pressed Metals sells no plane parts, except in buying out bodies and other parts for General Motors.

• General Electric's Lockheed, Ohio, assembly plant is turning out J-77 turboprop engines. More subcontractors are getting parts for this engine now number 250. They all parts of the engine. They are making:

- Aerostores, such as fuel regulation, fuel pump and flow dividers
- Hydraulics, including nuts, bolts, fittings, gaskets, and packings
- Parts and subassemblies, including turbine wheel, compressor rotor and stator, exhaust cones, and combustion chamber
- Raw materials, including casting, forgings, and plates

• Commercial Aircraft Engineering Corp., Buffalo, N.Y., has landed an order for 1000 parts for a long time, principally because the government allocated it. The company says that the big plants which did not have something in offer at the present time should still be logical to work with and slightly after work with them they were second best on.

This activity was also designed to avoid letting too many employees go because of lack of work. At least the key men could be kept in the plant, very essential in case more work were lined up in a hurry.

• Three Contracts. Grammerman now has three Navy contracts for the AC-130 U-2C, AC-130A, and F-104.

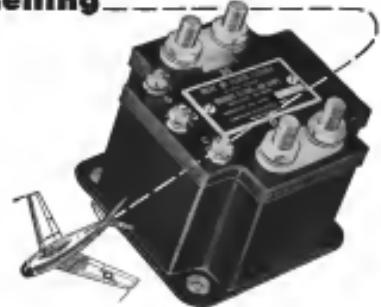
The UP has been chosen. That includes aircraft hatchets, which will soon, never, drop, and so on. The plane was already set up for production and most of these doors were to be made in the plant. However, subcontractors were subcontracted and now all the doors are made outside. About 30 percent of this plane, is now made outside. That is about 35 percent of the total cost of the plane. The big difference between the two figures is because all the tools and jigs that Grammerman had set up were transferred to the subcontractor.

Grammerman also supplies a large part of the aircraft structural equipment. Hard to get, and hard to make, stock. Grammerman claims that the cost is added to the contract price, and the actual dollar value is much less, not as great as the total value of the completed part.

Some of the purchased parts that Grammerman needs, the subcontractors have had some machining and that also reduces the dollar value of the contracts. The subcontractors usually buy standard stock parts (nuts, bolts, washers, etc.).

• Hold-up Ahead. Grammerman is getting ready for a substantial backlog, as set

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Sorts in present industrial applications aside, but they are not exclusive, either, and November, with the peak coming next September. Until the government does appropriate some of the Irish cooking houses, not too much will be done in the way of expanding barbecue stations or buying new personnel.

Geographical location does not play an important part in choosing barbecue stations for fabricated parts. Machine parts are a different story. Granite trees to keep these located, generally to cut down on inspection traveling time. But some are located as far as New Jersey and Pennsylvania. Mostly, the business is kept in Granite's own backyard.

The subcontractor's workmanship and accuracy and part production are

and are important to Granite.

► **Hawthorne Standard** division of United Aircraft Corp., E. Hartford, Conn., buys from about 1900 subcontractors and vendors in 25 cities. Sixty percent of these are in Connecticut and New York, but some are as far away as California.

To Hawthorne Standard, a subcontractor is a manufacturer who contracts to make a part or component in the design of the prime contractor.

A vendor is a company or individual which sells a device or finished product of its own design.

► **Lockheed Aircraft Corp.**, Burbank, Calif., admits to only one subcontractor—Riley Aircraft Corp. of San Diego

Role makes the complete assembly still power package for the Constellation.

But the company has over 2100 regular price suppliers.

About 40 percent of the Constellation (in dollar value) is outside purchase—parts, subas, etc. The figure for military type runs to about 35 percent of the total.

Right now Lockheed is undergoing all alterations as subcontractor parallel, two-tier machinery, plant space, potential production, etc. The company wants to have as far as a good list of assets in case of further裁減.

Lockheed specifies cost and runs the plant of each prospective subcontractor. The company says it will probably give out small jobs to start.

Lockheed prefers companies with previous aircraft experience, people who understand aviation, tolerances and specifications.

The company says it is unusual as selection of its subcontractors because it has just given the Air Force a 10-year cost-protection. Lockheed is the first company allowed to perform on a real basis inspection work previously handled by Air Force inspectors. The company is anxious to maintain its present quality control.

► **North American Aviation, Inc.**, Los Angeles, has about 530 subcontractors.

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now. That's according to North American's definition of subcontractor-sub subcontractor. It doesn't include catalog items such as aircraft engines, aircraft, aircraft of general operations, etc.

North American contracts out many assemblies it could do in its own plant.

But it tries to subcontract to the maximum in line with Air Force policy. The company is unable to infinite as many aircraft suppliers from its vendor list, but approximately 1500 people still everything from paper clips to sensitive electronic devices to North American.

Approximately 22 percent of the dollar value of plane contracts is sub contracted out to further subcontractors.

Know-How. Know-how and adequate facilities are two of the things North American looks for in having a sub contractor. Geographical location is important, too. NASA likes to have subcontractors in the local area for its pedigree, which would prefer them right across the street.

In the last war a number of North America's workers set up their own shops with a few thousand dollars. Mostly they did milling machine and lathe work.

► **Northrop Aircraft, Inc., Hawthorne, Calif.** presently uses about 150-400 subcontractors. That includes about 50-75

people who make settings and forgings. Northrop specifies: "The job needs to be done." It includes people who do intricate machining or plating, some who make parts like spacers to specification. But it doesn't include suppliers who supply articles off the shelf.

Northrop's present table of subcontractors is small because it hasn't had too many big orders since the Korean War. But Northrop is looking up for increased production on the F-105 Scorpion all-weather interceptor, and it's a good guess the number of subcontractor will soon double or triple.

Northrop has about 2000 active suppliers. About 1500-1600 are regular suppliers. These figures do not include government contractors.

► **Stand Up.** Northrop's vendor parts supplier list will be expanded only if it is necessary to look for more sources. The company already has hand up at least one source for every item it might need.

Northrop contracts out 40 percent of the airplane as items of material. No figures available on the amount of the plane subcontracted as items of value.

The company's buyers have the responsibility of choosing the basic subcontractor to do the work. That's because they bear the chief responsibility for getting the work to an end.

► **Location Important.** Geographical location is very important to Northrop.

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Write today for full information on these production units or we will be glad to provide engineering assistance on special designs.

By Captain A. H. Ross



The company prefers to subcontract to local service. Cost control is first concern. It is demanded for all the time that an engineer designs that take place while an engine is in production. Los Angeles has a monolithic source of subcontractors, so there is little problem there.

Nothing doesn't necessarily look for a place of some use to start with. Of course, large assemblies require a pretty long plant. But otherwise the ability to do the work on schedule is great merit.

The company has more cases where a one man plant was a welcome addition to the lot of subcontractors. In many cases, he said, small plants can do the job more efficiently and at a lower cost.

The big ones sometimes are too bogged down in paper work.

► Pratt & Whitney Aircraft Corp., East Hartford, Conn., Julian French, Researcher's long-established policy of sending out at least half of its work. It is still dealing with only all the 200 suppliers on an original list of 25 years ago. The list itself has grown to 4,600 names.

Many companies in the Hartford area have built their whole business around P&W subcontracting.

Typical subcontracts include forgings, forgings, gear, compression, turbine blades, microfinished hardened and ground parts, some machine parts, etc.

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The big ones sometimes are too bogged down in paper work.

► Republic Aviation Corp., Farmingdale, N. Y., has tried to keep practically all of the better subcontractors that worked for it during the war. Since the end of the war, it has doled out small orders to the reliable firms just to keep them open.

An engineer, Republic says, is doubling his production hours 3½ to 4 hours a day and doesn't need any additional labor, contraction, since the present ones can handle the increased needs.

Republic has about 30 percent of its volume production out to subcontractors amounting to around 25 percent of the dollar values.

Possibly 15 percent of certain original equipment and assemblies come from the West Coast since that's the principal place of plane manufacture. Usually though, subcontractors don't go that far away.

► White Pass. When a part is turned on a Repco lathe, the subcontractor is to make the whole part. No work is done on the material in Repco either before or after the part is completed. Extra responsibility is on the subcontractor for the quality of workmanship of that part.

The most vulnerable side of the small subcontractor is his lack of a suitable inspection system. He should try to maintain adequate quality control. A Rockwell hardness tester is a must for a subcontractor.

Any welding work must be done by a certified Air Force or Navy welder depending on which service the plane comes to with.

Another of the lowest bidder gets the contract issued. If the firm is not much lower than the next bidder or Republic's estimate, the reason by which the subcontractor arrived at his figure is checked. Sometimes it may be a new twist and a good idea, or again it may be a matter of under-estimating. Republic doesn't want bid prices to show up at be delayed on delivery dates.

Republic thinks the small men should there at least 10 percent of his plant out subcontract work. The ideal amount would be to use about 50-60 percent. To get this much work, the man of production would be forced to have two or three small offices. That's what gets him into trouble, the end office should represent more than one order, possibly three or more. This is in contradiction of one will not put the company in a hole. Republic now has about 325 sub-contractors.

Vendor sheet include valves, carburetors, magnetos, fuel pumps, control devices, Pto/flow, air-cooled engines, gearsets, bearings, instruments, air-locking units, etc.

Supplier sheet are raw materials and process materials, such as sheet steel, bar stock, tubing, plating materials, etc.

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(Continued on page 111)

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These fine aircraft service facilities, recently completed at Minneapolis-St. Paul International Airport in Minneapolis, give Northwest Airlines an additional 19,000 square feet of hangar space. The largest will (painted shown above), with a base area of 8,000 square feet, houses two Boeing 747s. The other two, with an area of 21,000 square feet, will house 3 Douglas D-8s and 1 Douglas DC-4 simultaneously. Shop areas, storage and office space are included in a separately roofed structure between two of the hangars. Total cost for this complete installation was \$1,160,000—about \$11.75 per square foot.

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Standard Buildings
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The transportation problem becomes important when production is critical, as in war-time. So, for the sake of saving delivery, Bepko thinks that large orders should be split between two or more suppliers. This brings in two sections of the country and not delay final assembly of the aircraft. The idea may be of use to subcontractors when they order.

Bepko suggests that now is the time to line up subcontractors as a means of finding out techniques who may be getting service or defense work and taking orders as they develop.

• **Sparti Gypsum Co., Great Neck, N. Y.** has done a thorough job of subcontracting its largest production case 1948.

This contract is for an automatic solar and aircraft gun fire-control unit, ground oriented. It is a large piece of machinery comprising many separate components, in "seaworthy" packages. These 74-75 units were designed to be made separately, and it was found that about 40 could be subcontracted out.

• **Plant Surveyor**, Sparta started off with a name, at all times, which could logically be expected to handle its work. That name got them from records of past business transactions. Thomas Repko, chairman of the advertising, etc., firms were picked that were known to do certain kinds of work. The best suited firms were determined by reputation, character, past or present experience, and based for further studies.

The initial lot of 100-138 was narrowed down to about 40 or 45 companies who were invited. All that was available to show the type of work or quality were photos of the separate parts of the machine. This initial list determined the best names from and the ones that could be used for the first lot of work at 10. The list was down to about 25 firms who were now sent complete blueprints.

The idea was to have about 10 different parts subcontracted in each package as type of package. It was possible and desirable to combine two or even three parts, such as the armrest and the center indicator. Some of these units used the same chassis and only slightly different components which made them assembly and manufacture by the same firm desirable.

• **Pioneer Corp.** If a company indicated it was interested, a "Questionnaire" was made by a group of engineers, in question, quality control, and methods people to see the kind of a place they were doing business with. If it was liked by the inspecting group, formal prints went out and bids asked for each assembly. A bidlist of each bid was also required. Once this, prints were compared to Sparta's own prints. (Up to this time Sparta had only



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MANUFACTURING

built two prototypes with a third under construction.)

As the quotations came back, they were reviewed with the men thought to be the lowest bid. Other considerations were the delivery dates proposed and the expected capacity of the plant to meet these delivery dates.

• **Quality Control.** One very important factor was the degree of quality control employed at the plant. This is the "life-blood" of Sperry since all the units are guaranteed and have made their reputation. It was absolutely necessary for each plant to have some form of quality control and the better systems were given preference.

Finally about a dozen subcontractors were signed up. The entire operation took about four months but Sperry feels it will more than justify itself when the parts start rolling in.

For the percent of order, about 40 percent will be delivered out. This amounts to about 30 percent of the contract value, or roughly \$10,000,000.

Small machining and tool work is given out quite a bit. Any good quality shop can expect to get a fair amount of this work. In the near future, if you choose a company large enough to warrant

it, you can expect to subcontract for Sperry. It is invited to send in any list of known pamphlets or other literature describing available sections and the work done.

Intros are granted to any prospective subcontractor who visits the plant, although a phone call first is suggested. All correspondence is kept on file. Sperry is pretty well set up right now, but the company is always looking for subcontractors who can meet its standards, a policy it has to have or some good firms bidding on each order—with the contract often split between the two lowest bids.

Official test data are good, reliable man should have no trouble getting in any television test at the present time. The conditions for firms which are financially shaky is not so good at the present time.

• **Wright Aerocommand Corp.**, Wood Ridge, N. J., is making a study to determine what its volume of production will be and just how much of that should go to subcontractors. At first, Wright doesn't do very much outside work. It is an assembling operation, no assemblies. Wright wants to do all of the work itself that it possibly can. If any work is given to subcontractors, they are expected to do the complete job. Wright doesn't do any work on the part before or after the vendor's work.

• **Security.** Almost all supplies who work for Wright must be classified for military security reasons. This prevents

start off with government inspection, mostly by FBI men. Then they enter into a security agreement with the Wright organization.

Wright now has about 35-37 subcontractors on the books. Very few were kept on after the war—the idea was to keep an open plant very fast.

Geographical location is now important to Wright. Work is received from as far as Chicago and Detroit, coming in by train. Economic reasons are not as important as determining who will get an order rather than keeping the cost right is Wright's own thought.

Air Force Buying Moving Into High

The heavy outpouring of Air Force expenditures for defense is typified by a recent week's contracts received for processing by the Chicago AF Procurement Field Office.

Contracts valued at \$4,485,210 were announced yesterday by Lt. Col. Charles G. East, chief of the office. Of these, more, exceeding \$100,000 each, went to manufacturing facilities in fact, 14 of which are owned by the office. The area includes Illinois, Wisconsin, Minnesota, North Dakota, South Dakota, Wyoming, Montana, Colorado, Kansas, Iowa, Missouri, Nebraska, northern Michigan, and southern Indiana.

A dollar total for August was not yet available, but during July, 1,060 contracts were handled, with \$135 million total to go for the government to contractors as of the end of that month.

Col. East suggested that business seeking subcontractors get in touch with procurement offices, which they located in World War II. Although information may also be obtained from local chapters of consumers, trade associations, offices, state employment office, Department of Commerce of War, and at the Laboratories for each of the various AF procurement field offices.

Big Contracts Seen For Boeing-Seattle

Boeing Aircraft Co. is clearing the doors of its Seattle plant in anticipation of good-sized USAF contracts resulting from the Korean trouble. The Air Force already has asked the company to make proposals concerning various projects. These have been made and now Boeing is awaiting the military's decision.

Opinions were further developed by Sam W. May, manager, who predicted, after conferring with AF officials, that Boeing-Seattle can expect to receive \$300-350 million in orders.

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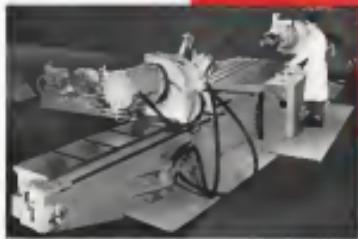
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because of the pool of skilled aircraft workers in that area.

In light of these developments, the company not only has canceled its recently scheduled employee layoffs, but has been advertising for skilled metal machinists and tooling engineers. Boeing's vice president-counselorizing Paul Ladd does say that 100 skilled machinists are needed.

Present schedules call for completion of a B-52 Superfortress contract this fall, which work includes tailoring parts for nearly 100 B-47 Strategic bombers and the C-97 transport. In addition, preliminary construction has been started on the XB-47. The company is now striving to make these orders as clear as possible.

Security Regulations

Boeing Munitions Board security regulations covering government contractors are coming out. They will deal with security clearance of a contractor's facilities as well as its employees.

Major changes apply to clearance of employees on classified contracts. Where a contractor has contracts with more than one government department, only one department will make the security checks, to avoid duplication.

When a worker moves from one em-

ployer to another, his record will be cleared through a central security office located in Washington. That a worker will be able to carry his clearance status along with him from one job to another.

In many cases only parts of a company will be cleared. This will reduce the number of workers who will have to be cleared for security.

Aviation Boom Grows in Wichita

Wichita—The aviation industry in the Midwestern city is housing with the usual bottleneck of labor, materials and housing housing just over the horizon.

Boeing-Wichita is the biggest of the aircraft and aerospace contractors around here, a group which includes Beech, Cessna, Beech and Stinson. Inc. Boeing-Wichita is just entering into production of the enormous B-47 jet bomber.

Currently, Boeing employs approximately 11,500 personnel on two eight-hour shifts and a third stub shift. Plans are for a total employment growth to 15,000 by December 1, in order for Boeing to support the backlog of orders.

USAF plans to have its first B-47 wing operating by mid-1951. Air Force has asked Boeing to step up production of more than 700 of the jet bombers, as contract is completed by mid-1952. Started in 1951, it originally planned five of the big bombers have been built. Four more are nearing completion.

Production of the bomber is being carried along through considerable subcontracting both in the Wichita area and elsewhere. All three of the other local manufacturers, Beech, Cessna and Stinson, are engaged in B-47 work. Beech, Avenger, is turning itself to small parts manufacture. Cessna is a major assembly project and Beech will likely engage in B-47 modification at its newly acquired Hastings AFB, Kan., facility. The Herkinton facility was used during World War II as a B-17 modification center.

The expectation is that Boeing will be called on for more modification of over 400 of the Boeing modified bombers. Approximately 70 of them will be the B-49, with four jets.

Boeing, in addition to producing its heavy conventional bombers, is currently making jet-powered 225-gal. F-80 whiz-bang tank. It is also continuing rehabilitation of Navy B-57 bombers. Thirty planes (about 150 are on the Beech wings now) The company expects also to build between 400 and 600 B-57s before the end of the year.



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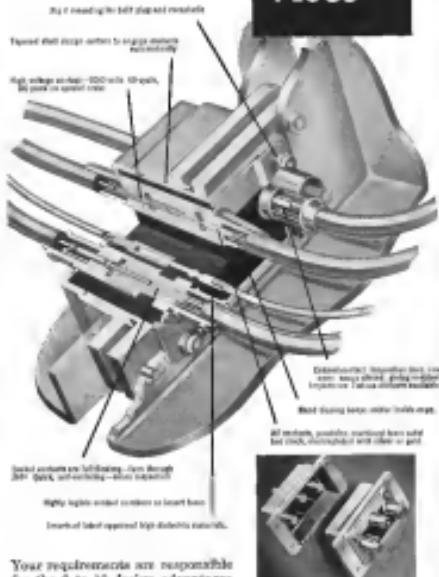
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How USAF Helps

A Subcontractor

A subcontractor is one removed from the government agency that grants the prime contract on which he is working, but on occasion the government agency will go to bat for him to see that he gets his money.

This cropped up earlier this year at the hearings before the House Appropriations Committee on the Air Force fiscal 1951 budget.

Just where the government's responsibility to the subcontractor begins and ends has been a hot legal point since subcontracting flared during World War II. Going over the ground again with Lt. Gen. K. B. Wolfe, USAF chief of procurement, Rep. Harry Sheppard of Calif., was told that the Air Force watches the prime contractor accounts pretty closely.

► **Wolfe's take:** "Unless the Air Force will make a partial payment on a prime contract it thinks the contractor's amounts to be reasonable, he has discharged his obligation to his subcontractor. That is the only hold we really have on him [the prime contractor]," said Gen. Wolfe, "when he comes in and asks for partial payments or advance payments."

Other than that, the Air Force tries to stay away from relations between the prime and subcontractor. In certain contracts, the service will tell a subcontractor he may use subcontractor, pay him directly, and guarantee that he will not be breaching his agreement if he farms out part of the work.

► **Legal Responsibility:** But when the Air Force puts such a provision in a contract it becomes a legal matter whether the government has any responsibility to the subcontractor. Gen. Wolfe pointed out that the prime contractor negotiates directly with the government on renegotiation and extension of the contract price. This isn't always true of subcontractor; they have to leave it up to the prime contractor to look out for their interests.

And more than once, according to Gen. Wolfe, "the little business man has to come to us and complain that he is not being treated by the prime contractor the same as the prime contractor is being treated by us."

It means, in the opinion of both Gen. Wolfe and Rep. Sheppard, that the prime contractor should be forced in such a way that it would be clear that all responsibility to subcontractor begins and ends with the prime contractor.

But they both also agreed that to accomplish that end world requires a very thorough legal survey of the entire situation.

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From *Mark*, Aug. 2, '50, p. 107

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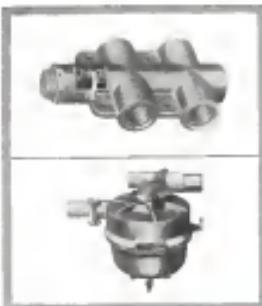
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The Outlook for the Labor Supply

If you have to hire for defense work you may have trouble getting certain skills in certain areas.

If so, then you will have to hire new employees to fill defense orders, and the way the situation looks

Manpower is getting tighter, particularly in aircraft centers. This applies both to overall labor supply and to skills necessary to support production.

No equipment contractors, regardless of their size, are involved in the War effort under the "covert" program—meaning a war confined to Korea. But there are a number of voluntary members already in the works, or contemplated, to help alleviate the manpower shortages cropping up in key production areas. These include:

- Giving priority to defense contracts at the time employment offices is handling requests by workers and referring job applicants.

- Training programs for production workers, like the apprenticeship programs in apprenticeship crafts and the U.S. Metal Industry Job apprenticeship of the last war.

- Draft deferment for young men on the "covert" occupation list of July 14, 1950, issued by the Labor Dept.

Here is what has been happening:

Noteworthy, the righting of labor supply is reflected in the sharp up-employment from 1.2 million to 2.5 million and the increase in jobs to a record 62.7 million.

Tight Supply—Locally, it can be seen in the increasing number of areas with tight labor supply. In July, for instance, twelve defense production areas got general employment up to 116 of the 140 major industrial areas nation-

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Keeping Secrets

You must have security clearance to get any classified contracts.

Below you will be allowed to produce aviation requests for the government, you must be able to protect aviation secrets from the enemy. This rule applies to contractors and subcontractors alike.

► **Below Getting Contract.** Below you can even get a look at a classified contract in order to prepare a bid, you must have a "facility security clearance."

This consists of:

► **Examination of the plant to see that it is physically suited to protect our secrets.**

► **Check on officers, directors, owners and any key employees who will have access to classified work.**

Facility clearance will be denied if the plant, shop, laboratory or other place where the work will be done is physically unsuited to insure protection against espionage, sabotage or other subversive efforts.

It will also be denied if any key person who will have access to the classified work is "unstable" according to standards set up by the Army-Navy Air Force Personnel Security Board.

Classification will be denied to a company owned or under the control or influence of foreign interests "under circumstances which may jeopardize the security interests of the United States," or if any key employee cannot be cleared.

Clearance usually will be denied to an employee who:

► Has been involved in treason or espionage.

► Is under the influence of a foreign government which might propagate war secrecy.

► Has supported the overthrow of our government by force.

► Has disclosed classified information to persons not authorized to receive such material.

► Does not have the integrity, discretion or responsibility necessary to keep a government secret.

► Is or has been a member of one of the subversive organizations as the laws that are used from time to time by the Attorney General.

In contracts for atomic parts and accessories, a special sub questionnaire (NMS Form 15) will be filled by all subcontractors in the photo or mechanics or contractors, or will participate in the contract trials, whether or not armed to classified material it involved.

Security clearance will not necessarily be denied because you happen to have a non-classified employee who cannot be cleared. Rather than denies the employee you may put him on non-classified work.

Decision to deny clearance is made by the ANAFIBSD. Unless clearance is denied because of the plant's physical elements, you may appeal a denial to the Industrial Employment Review Board at the Pentagon.

► **Below Beginning Work.** Loyalty, integrity and trustworthiness of employees working on classified contracts is deemed essential to maintain security and is fundamental to the handling of military contractors by a contractor's own methods.

Investigations are made by the department concerned with the contract. Classified military information may not be given an employee until he has been "cleared."

"Background investigation" is made of all employees who will have access to "top secret" material and of all others who will have access to any classified information. This is a full investigation of the employee's activities over the past two years.

"National agency check" is made of those employees with access to "secret" data. This is a check of FBI and regional offices intelligence files. If derogatory information is found, up, then a background investigation is made.

No clearance will be denied if an employee will be "cooperated" or "coincided" earlier under his or her contract. There is evidence that he is a security risk.

Employees also may apply directly to the Industrial Employment Review Board.

To expedite contracts, clearance is granted unless it can be justified to a certain extent.

Clearance records, both as to facility and employees, are kept in a Central Index File at the Pentagon, so that data sheets won't have to be duplicated.

► **After Work Begins—Responsibilities for plant protection rest basically with management.** However, plant managers and small business firms may have local military commanders. It is recommended, too, for the security of classified nuclear facilities which may come into its possession as a result of its contracts. See printed sets of subversive or espionage should be reported to the nearest FBI office.

More detailed information and rules, after rules and regulations of the Defense Dept. are contained in a 25-page pamphlet, "Principles of Plant Protection," just issued. It was prepared by the Industrial Security Division, Office of Management, Washington Board, and is available for 15 cents from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

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Procurement Bibliography

Here is a list of useful catalogs, user and buyer references, and laws governing procurement.

- **A Guide for Selling to the United States Air Force**, 24th, obtainable from the Contractor Relations Branch, Procurement Division, Air Materiel Command Headquarters, Wright-Patterson AFB, Dayton, Ohio or at the Procurement Information Center, Pentagon, Washington 23, D. C.
- **Selling to the U. S. Navy**, 1965, obtainable from U. S. Government Printing Office, Washington 23, D. C., price 15 cents, or (plus) from a Navy procurement office.
- **How to Sell to the United States Army**, 1952, obtainable from U. S. Government Printing Office, Washington 23, D. C., price 14 cents, or (plus) from an Army procurement office.
- **Index of Military Purchasing Offices of Army, Navy Air Force and Marine Corps**, obtainable from Procurement Information Center, Pentagon, Washington 23, D. C. The index is by commodity type, but it omits classification.
- **Index of USAF catalogs of items purchased and copies of selected catalogs**

of them, classified as to type, obtainable from Air Materiel Command Headquarters, Wright-Patterson AFB, Dayton, Ohio, telephone MCP-223.

• **Armed Services Procurement Regulations**, Part I-15, obtainable from Government Printing Office, Washington 23, D. C.

• **Federal Register**, contains regulations of government agencies, including procurement regulations, as they are promulgated, obtainable from Government Printing Office, Washington 23, D. C., price \$15.00 a year.

• **Federal Law 413**, the Armed Services Procurement Act, 50th Congress, 1947, is still the basic law governing military procurement, obtainable from House Record Division, House, Capitol, Washington, D. C.

• **Index for Specifications and Directives Approved for U. S. Air Force Procurement**, obtainable from Procurement Division, Air Materiel Command Headquarters, Wright-Patterson AFB.

• **Military Renegotiation Regulations Under Renegotiation Act of 1948**, sold on subscription basis with revisions by Government Printing Office, Washington 23, D. C., price \$2.50 a year.

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AVIATION WEEK, September 23, 1960

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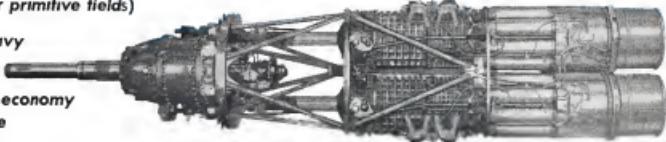
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